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# PUBLIC HEALTH REPORTS

*In this issue*



FEDERAL SECURITY AGENCY



Public Health Service



One example of international cooperation in the field of public health is construction of the Memorial Hospital at St. Lô, France. It is now being built to replace facilities destroyed during World War II. The architect's model of the 400-bed general hospital which is now nearing completion is shown here. The Public Health Service worked closely with the French authorities and their architect, Paul Nelson, from the earliest stages of planning. In the development of hospital planning standards for the construction of hospitals built

under the Hill-Burton program, consultation was held with the hospital authorities and architects of many other nations. As hospital construction began to get under way, the authorities in other countries consulted with the Division of Hospital Facilities in the Public Health Service on new developments in the Hill-Burton program. Cooperation has been given to hospital officials and architects from Great Britain, Sweden, Australia, Egypt, Iran, Peru, Colombia, Brazil, Guatemala, and many other nations.



# PUBLIC HEALTH REPORTS

Published since 1878

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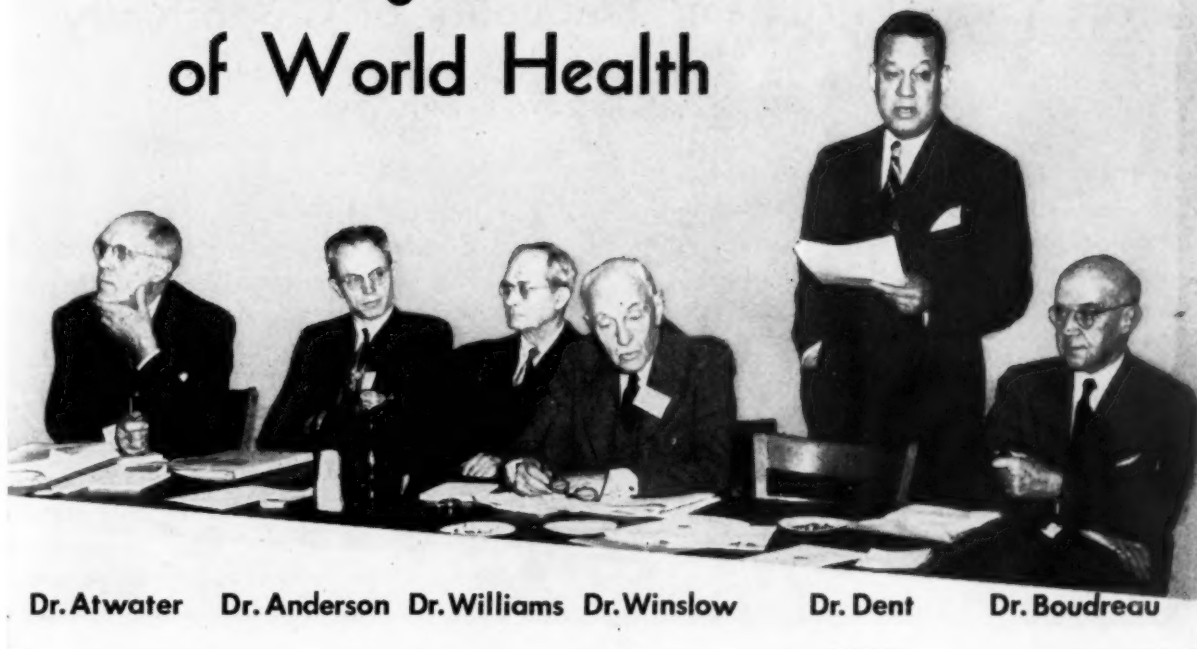
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## Meeting Problems of World Health



During the third national conference of the U. S. National Commission for United Nations Educational, Scientific, and Cultural Organization, a section meeting—one of 13 concerned with “major areas of cooperative effort for peace and security”—dealt with “Meeting World Health Problems.” Public Health Reports here presents the major papers of this symposium. This discussion, held in New York City, January 28, 1952, was planned in cooperation with the American Public Health Association, whose executive secretary, Dr. Reginald M. Atwater, was rapporteur for the section meeting.

The U. S. National Commission for UNESCO is required under Public Law 565 (79th Cong.) to “call general conferences for the discussion of matters relating to the activities of the United Nations Educational, Scientific, and Cultural Organization to which conferences organized bodies actively interested in

such matters shall be invited to send representatives . . .”

The first national conference was held in Philadelphia in 1947, the second in Cleveland in 1949. These conferences gave primary attention to UNESCO. The third conference, concerned with the relationship of the citizen to the United Nations system, was an effort of the National Commission to carry out the United Nations General Assembly resolution of November 17, 1947, relating to the UNESCO's role in educating about the United Nations.

Professor Winslow's introduction and the four symposium papers are presented in somewhat abbreviated form. Following each paper are a few questions as formulated by the American Public Health Association for the preparatory working paper. The opinions expressed are those of the authors and do not necessarily reflect the views of Public Health Reports, the Public Health Service, or those of the Federal Government.

# The Global Problem: Inequality of Opportunity

By C.-E. A. WINSLOW, Dr.P.H.

The basic problem which confronts us in the building of a stable and peaceful world is the appalling inequality of opportunity which exists between the peoples inhabiting different areas of the globe.

One-fifth of the human race, living in the countries of Western Europe, North America, and the British Commonwealth, have, according to the most recent estimates, an annual income of \$461 per person per year and an average life span of 63 years.

Two-thirds of the human race, living in Africa, Southeast Asia, the islands of the Pacific, and Latin America, have a mean annual income of \$41 per person per year and an average length of life of 30 years.

This inequality is our really fundamental challenge. Even if there were no political and military rivalry between powerful nations, it would still make a unified world impossible. The issue of the rivalry which does exist will ultimately be decided by the strength of the appeal which totalitarianism and democracy can, respectively, make to the submerged two-thirds of the human race. Only if we can gradually improve the living conditions of the suffering peoples of Asia and Africa and the islands of the seas—and if we can do this, not as patronizing rich relations but in the spirit of constructive human brotherhood—can the world of tomorrow be soundly built.

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*Dr. Winslow is editor of the American Journal of Public Health and professor emeritus of public health at Yale University. He has recently returned from Geneva, where he prepared the volume, "The Cost of Sickness and the Price of Health," for WHO.*

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The problems of poverty and disease in underdeveloped areas are complex and interrelated. Men and women in these lands are poor because they are sick, and sick because they are poor. A coordinated approach to control of disease, increase in food supply, development of industry, and improvement in education, balanced to meet the needs of individual countries, offers the only sound solution of the problem.

The United Nations and its affiliated organizations face a challenge to build up national strength and prosperity in a positive sense. The efforts in this direction will have more fundamental and far-reaching results than efforts to check aggression and prevent worldwide conflict in a negative sense.

This task has been in large measure delegated to the United Nations Educational, Scientific, and Cultural Organization, and to other specialized agencies of the United Nations, such as the International Labor Organization, the Food and Agriculture Organization, and the World Health Organization. It is with the latter that we are concerned in the present discussion, never forgetting, however, that its work must be closely coordinated with that of other international service agencies.

It is the possibility of fostering sound local programs of health service in the underdeveloped areas of the world which will be primarily considered in the present discussion. The limitations on the process are obvious. In order to succeed, we must have:

A soundly planned program . . . adequate trained personnel . . . understanding and support of the population concerned . . . and essential financial support.



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## "The Spirit of the Symposium . . ."

*"The problems of public health are relatively simple as compared with many other problems of international cooperation, but the successes so far attained may be encouraging to agencies dealing with more difficult areas.*

*"The spirit of the symposium on 'Meeting World Health Problems' was hopeful and confident. The view was expressed, for example, that in the year A. D. 2000, historians would look back on our mid-century as memorable for two of the most significant milestones in the history of the human race: the initiation*

*in Korea of the first exercise of world police power for the checking of armed aggression, and the development in the technical assistance and Point IV programs of a global responsibility for promoting by concerted international action the physical and emotional and social well-being of all the peoples of the earth."*

—from a summary report to the U. S. National Commission for UNESCO, prepared by Dr. C.-E. A. Winslow, chairman of the symposium, and Dr. Reginald M. Atwater, rapporteur.

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### Meeting World Health Problems, 1

## The Need for Sound Program Planning

By JOSEPH W. MOUNTIN, M.D.

The health task facing the world today is as vast and complex as it is important. If we are to make any inroads against the global burdens of disease, poverty, and ignorance, we need many things. We need, of course, the basic ingredients of men, money, and material. We need the incentive to progress that comes from popular understanding and participation. We need scientific knowledge, careful joint thinking and planning, effective organization, and high-caliber performance. Above all, we need soundly conceived health programs, suited to

the problem, the time, and the place, and designed to move logically to attainable goals.

One of the first steps in planning sound health programs is to determine what is involved in the term "health" for various parts of the world. Actually, one of our main problems is that people are not always clear as to the meaning of health, especially in terms of the measures that organized communities might take to improve it. Health requirements vary from place to place. In one area, the apparent over-riding need is for the organization of sufficient medical and hospital services to care for acute illness; in another, health workers have to turn their attention to long-term diseases and mental disorders, and to the health problems of an aging population; in still another, the absence of simple community sanitation and personal hygiene may lie at the root of the health problem; and finally, in some places, the lack of food and the inadequacy of shelter are in themselves public health problems of paramount importance.

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*Dr. Mountin, chief of the Bureau of State Services, Public Health Service, participated in the first meeting of the World Health Organization's Expert Committee on Public Health Administration, which convened in Geneva last December. This paper, prepared by Dr. Mountin, was read by Dr. L. L. Williams, Jr., chief of the Public Health Service's Division of International Health.*

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Moreover, the problems of health and disease do not exist in isolation but in varying combinations, depending upon a nation's stage of development. Many of them are woven into the socioeconomic and cultural fabric. Poor sanitation usually goes hand in hand with hunger and with inadequate education. A country that has a seeming rise in the rate of mental illness is also likely to have a complex physical and social environment. Hence, it is difficult to define health requirements in terms of specific organizational framework, precise program content, or per capita expenditures that would be comparable from one area to another.

Despite these and other variables, there are at least three principles of health planning and administration that we might consider. First, it is essential to determine the kinds of problems which organized health measures are designed to solve in any given country. Second, health, and patterns of public health administration, must be an integral part of the social, economic, and governmental structure of a community and a nation. Finally, many individuals and groups can contribute toward solving health problems, which means that sound planning must make a place for these contributions. Provision must be made within the organizations having health responsibilities—both governmental and nongovernmental—for an interchange of ideas and understandings and for working with numerous groups and agencies. Because of the complexity and the variety of needs, we must often go far outside the traditional public health setting to make effective progress.

#### **Program Related to Needs**

With this as background, I would define program planning as the mobilization of all resources and facilities to the best possible effect so that problems are solved. It seems to me that the last part of that statement is the most important. To talk about planning without relating it to the problems to be met is not only unrealistic, it is sterile. We are not planning for the sake of planning; we are planning for something. There must be an understanding of the problems to be solved, of the measures to be used in solving them, and of the objectives to be reached.

The next step is to undertake suitable courses of action for improving health and reducing the burden of disease. This step, of course, is never easy. A host of obstacles, real and fancied, organizational and administrative, may stand in the way. But an understanding of the problem will make any solution easier to arrive at. It will enable public health planners, for example, to look beyond a specific way of working or a particular kind of organization. Instead, they can evaluate what is available against what is needed and mobilize all of the resources which can be used to help meet the problem. Even in what to us might seem the most backward of countries, there exist many untapped resources and competencies which can be focused on health needs. If these resources are not used, many programs which look sound on paper may face insurmountable difficulties or, worse yet, may be doomed to early failure.

#### **The Health Department's Job**

What is the role, then, of the official health organization in a community or in a larger segment of government? First of all, it has a specific part of the total health job to do. This may vary all the way from providing certain direct services to setting standards or offering financial aid to other groups. In addition, however, the health department must recognize the underlying relationships of health measures and act as a general staff in coordinating all the community's health services. It should promote an integrated approach in order to achieve a common objective.

As was just noted, many obstacles stand in the way of effective program planning and execution. For example, programs are often launched without a real recognition of the problem or without relationship to the major needs. The demands of special groups, the dramatic appeal of certain diseases and conditions, the pressures of expediency, apathy and resistance to change may all throw sound planning out of balance. In addition, shortages of resources—funds, personnel, facilities—often prevent orderly program development. For this reason, a very careful estimation of the kinds and numbers of personnel and the amount of funds needed must be an essential part of program planning. For

this reason, too, a logical order of development must be worked out. In other words, we must set priorities which will allow us to expand or take on new responsibilities if the ingredients are available or to retreat in the event of shortages.

### **Balanced Program**

This brings us to one of the biggest problems facing the underdeveloped countries: the balancing of immediate needs against long-term programs of permanent health service. First things must obviously come first. Because of the tremendous backlog of existing disease, many countries may turn to programs of medical care and hospital services. In doing so, however, they are often likely to neglect the preventive services and the public health organization through which these services can be brought to the people.

Both types of need must be met. In order for this to be done, the health organization must be flexible. It must be prepared to solve the pressing health problems and then move on to new programs without losing ground. We must always remember that we want to build dynamic organizations to meet dynamic situations. One of the ways in which this can be done has already been mentioned, that is, taking advantage of all health resources or all opportunities for improvement, no matter where they may be found.

In planning to take on new responsibilities, however, we must recognize the dangers inherent in piecemeal growth. Such a development is likely to foster an incomplete, segmented approach. Not only is an organization likely to grow unwieldy and difficult to administer but, more important, it may lose sight of total objectives. In program planning, we must always work toward a synthesis in order to direct our attention to the whole man and the whole community.

### **Trained Personnel**

The caliber and kinds of personnel available play an important part in program planning and administration. Of particular importance is the need for auxiliary and nonprofessional

workers. Up to now little serious thought has been given to such personnel as inspectors, aides, technicians, and others who perform many of the routine operations in this country, and who could be relied upon to provide the bulk of services in less highly developed countries. As a result, even when program planning is relatively good, the actual conduct often falls below our expectations.

This must be considered an important element in sound planning for two reasons. First of all, the training of auxiliary workers should have a high priority in all organizations. Second, the organization should be such that maximum use is made of highly trained professional personnel. Routine details should be delegated to auxiliary or less highly specialized workers. I think we in this country have a great responsibility in learning how to use these workers more effectively and in helping other nations develop the kinds of personnel who will be suited to their needs.

### **Public Support**

Public understanding and support can also be made a part of planning. Public health programs should be so organized that the people who have the problems are given an opportunity to plan and contribute to the solution. Too often there is little participation by the individual, who passively receives the services. In a sense, health officials should aim to make every citizen a public health worker, at least in his own behalf. This can be done, in part, by mass education combined with proper devices for motivation. In part, however, it depends on how soundly our programs are planned and how logically our organization is developed. I think there is no question but that people will support a program they can understand and that is meeting their real needs.

Public enlightenment becomes particularly important when planning health services in many parts of the world in which such services may be foreign or strange. We must remember that we have reached our present state of development in this country because health is part of our mores, is inextricably bound with our way of life. Personal hygiene and sanitation are taken for granted as part of our daily existence;



immunization and vaccination are accepted as necessary and desirable to preserve health.

In many parts of the world, however, such prerequisites do not exist. Some health measures may even go counter to local or national customs and may be fought by the very people they are intended to benefit. The importance, thus, of relating planning and organization to local needs, customs, and abilities cannot be overstressed. Although advisory and technical assistance may come from outside, lasting health reforms must be undertaken within a country and must be adapted to local conditions. Uniformity of methods and organization would be highly desirable, of course; but the wide diversities among different countries may dictate considerable variation in methods of achieving health goals. Many paths may be taken to reach the same destination.

#### **Other Planning Needs**

Other elements of sound program planning should be mentioned here, even in such a brief review. For example, we need to evaluate progress constantly and critically, in terms of our problems and goals, in order to overcome any tendencies toward self-perpetuation or toward allowing our work to become routinized. Other aspects of planning for health services

include such items as: the differentiation of functions at various levels in the governmental structure; the regionalization of health services; the necessity for aligning preventive and curative medicine through the coordination of hospitals and health departments; the need for incorporating hygiene into industry, commerce, and public works; and the need for effective communication and for clear-cut lines of authority and responsibility.

I would conclude, however, with the need for increased exchange of experience and knowledge among all the countries of the world. Certainly, we in this country have as much to learn as we have to contribute to world-wide development. No single nation can lay claim to all the competence and all the wisdom. Moreover, public health programs everywhere—and certainly this country is as guilty as any other—are limited and rather narrow in scope. We have often failed to add new services to meet current health needs and to take advantage of new methodology to further the cause. We must thus raise our own sights as well as look toward the problems and needs of the rest of the globe. With a true spirit of cooperation, with a basic understanding of needs, and with the efforts of enlightened groups everywhere, we can push forward to new frontiers of world health and well-being.

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#### **To be solved . . . . . Problems of Administrative Planning in World Health**

- *How can the most pressing health problems in a given country be determined?*
- *What significance must be given to the mores of the people concerned?*
- *How can a balance be struck between programs designed to obtain immediate dramatic results and long-term programs to develop permanent health services?*
- *What per capita expenditure for health purposes is possible for a particular country?*
- *How may a program be planned so that it ultimately can be supported by local resources?*
- *What can the United States learn from the program-planning experience of other countries?*



## The Need for Personnel

By GAYLORD W. ANDERSON, M.D., Dr.P.H.

Modern public health requires an adequate supply of well-trained personnel, whether the programs be conducted on a local or an international basis. Such a statement is almost axiomatic and should require no defense, yet experience shows that the truth of it is frequently not appreciated by those responsible for the planning and direction of public health. In too many instances there has been a virtual assumption that a reasonably adequate basic training in medicine, engineering, or nursing constitutes adequate background for the vast responsibilities of community health protection. Many of the failures and shortcomings of public health can be attributed to a lack of suitably qualified personnel.

### Modern Concept of Public Health

This failure to appreciate the need for special training stems from the thinking of an earlier era when the prevailing concepts of disease were couched in terms of toxic emanations from decaying filth. Public health of that period was little more than a program of simple cleanliness and hence had no need of specially trained staff. While no one would question the accomplishments of such activities nor would doubt the potential benefits from their extension to many parts of the modern world, our present concepts of disease are not so delightfully simple.

Today we recognize the influence of a vast

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*Dr. Anderson is director of the School of Public Health, University of Minnesota, and president of the American Public Health Association. He conducted the sessions on professional health education at the Fourth World Health Assembly in Geneva last May.*

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array of physical, biological, social, and economic forces which operate either singly or in combination to exact a high toll of preventable illness and death. Modern public health is the synthesis of the contributions of a great variety of disciplines—a combination of the physical, natural, and social sciences, with a large component of the arts and the humanities. As such, it needs personnel with a sound foundation in their respective fields, supplemented by an understanding of the application of these disciplines to the prevention of disease and a broad appreciation of the interrelationships of the several fields of learning as they impinge upon public health.

A simple example will suffice to illustrate this need. The modern malaria control program is based upon the contributions of the physician, the parasitologist, the entomologist, the chemist, the toxicologist, the pharmacologist, the engineer, the nurse, and the educator. None of them can understand his or her role without some appreciation of the social, economic, political, and climatologic forces that condition the strangle hold that malaria has held on certain areas. Each must understand the relationship of his contribution to the total program for malaria control. Each must further realize that malaria control, like all other programs of public health, is a team operation in which each member must understand his particular function and its relationship to the tasks assigned to his associates. Unless this concept of teamwork is recognized, public health becomes a chaotic jumble of uncoordinated and, at times, conflicting programs, each of which is well-intentioned, but failing of its full potential contribution because it is not properly integrated with other closely related programs.

The training of personnel thus becomes one of the foundation stones of modern public

health. In the development of its world-wide program, the World Health Organization, following the example of several philanthropic foundations, has therefore very properly given major emphasis to training. A sizable fraction of its very limited budget has been set aside for this purpose. Some of it has been assigned to the betterment of training facilities within various countries. Another large part has been allocated to individual grants whereby selected personnel might be sent to appropriate centers for specialized professional education.

#### **Varied Personnel Needs**

The needs for personnel to be trained must obviously vary greatly from one country to another according to the culture and the problems of the respective nations. In the United States we speak glibly of the separation of curative and preventive services and toy with desired ratios between populations and the numbers of health officers, physicians, nurses, and sanitation personnel. Certainly there is no basis for assuming that such ratios have any meaning outside of our own area. In one country the most urgent need may be for more and better-trained physicians, for in that area there can be no fictitious separation of therapy and prevention. Another nation may have an acute shortage of nurses; in a third the sanitary engineer may be all but unknown, and a fourth may require physicians skilled in some medical specialty.

It would be highly unrealistic to pretend that any predetermined uniform standard might be used to describe the personnel needs of any country. We must recognize as a cardinal principle the fact that the needs of each country must be individually determined and that no agency such as WHO can ever do more than suggest to a nation the direction in which it should proceed in determining its training needs and allocating its training grants.

#### **Personnel Selection**

It would seem axiomatic, however, that in the selection of personnel to receive such grants, preference should be given to those who, upon return to their respective countries, will

be in a position to influence the development of sound programs and to contribute to the further training of their fellow countrymen. These persons must be sufficiently advanced in knowledge and experience so that they can profit from the stimulus of new contacts and ideas.

We must not expect, however, that all such students will be sent to one or two foreign countries well-equipped with training institutions. No nation can lay claim to a monopoly in public health knowledge, nor could the schools of any one country pretend to be able to furnish the detailed instruction requisite to meet all the health needs of areas of such different problems, customs, and culture. There is no suggestion that the health programs or procedures developed in one country are necessarily applicable to a distant land.

Those who are sent for foreign study must be persons with a background and understanding which will enable them to separate the basic principles from the operative details and select those ideas which are transferable to, or may be modified to meet, the problems of their respective countries. No greater error could be made either by student or teacher than to assume that the public health program of one nation could ever be transposed in its entirety to any other land.

#### **Regional Training Centers**

It would be equally fallacious to expect that every country, regardless of size, would ever be prepared to maintain full training facilities for all public health personnel. While most countries possess or can look forward to the establishment of schools of medicine, nursing, and engineering, there can be no justification for comparable development of schools of public health.

Rather we must envision regional centers serving nations of comparable culture and language, centers which will provide the basic training needed for those who are entering upon a career in public health. There can be little doubt of the waste of time and money when a person without a background of experience is sent to obtain basic public health training in a country whose language he does not under-

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## To be solved . . . . . Recruitment and Training of Personnel for World Health

- *How can the training of additional personnel—particularly health officers, physicians, nurses, and engineers—be further facilitated, and to what extent?*
  - *How far should training needs be met by the development of professional schools in areas where such facilities are now lacking?*
  - *What responsibilities have universities and health departments in the United States for the temporary release of personnel for foreign service?*
  - *What responsibilities has the United States for providing training facilities for foreign students?*
  - *How far, and in what ways, can the limited supply of highly trained professional personnel be supplemented by the preparation of auxiliary workers—medical and nurses aides, midwives, sanitarians?*
- 

stand. Such a student learns but little and, amidst the linguistic handicaps, finds himself unable to extract from the myriad details those few basic principles which, with suitable modification, he might apply in the position to which he will return. He becomes both confused and discouraged by the details which he recognizes as inapplicable to his country. Regional training centers, even if they lack some of the facilities of large foreign universities, would nonetheless serve a more fundamental need in the training of the great mass of personnel required for the public health programs of the various nations. Foreign study should be reserved for the advanced student.

### Broad Training Programs

In planning for training programs, we must not forget that provision must be made for many types of personnel. I have already stressed the point that an effective public health program depends upon the contributions of persons of a wide diversity of professional backgrounds. If I may criticize our present training programs, I should say that we have given too little attention to nonmedical personnel. There has been too great a tendency on the part of schools of public health to overlook their responsibilities for the training of a coordinated team of workers.

We cannot leave the training of our co-workers to the mercy of professional schools having little or no real interest in public health. The modern school of public health should be a

place which receives professionally trained persons from a wide variety of disciplines and adds to their existing knowledge an understanding of the application of their specialities to public health problems and a grasp of the interrelationships existing between the contributions of each profession. The educational isolationism that has characterized so many of our professional schools is as unrealistic as was the political isolationism of an earlier generation.

Equally important in any training program is recognition of the needs of the subprofessional auxiliary worker. It must be quite obvious that the many tasks of public health do not uniformly require professional skills and that many countries will not possess within the foreseeable future an adequate supply of professional persons to perform the duties that one might wish to assign to them. It would be quite unrealistic to sit back and do nothing because of a shortage of persons of desirable professional background.

Many of the duties in environmental sanitation can be assigned to sanitarians lacking engineering background, and many of the instructional duties of the public health nurse may be carried out by a nursing aide, or home visitor. There are many situations in which the limited funds available for public health can be spent to best advantage in the employment of such personnel, provided they have had adequate training for the tasks to which they are to be assigned.



The problem of subprofessional training is simpler than that of professional education as it requires less time and expense. It should, however, be recognized as an important and fundamental part of a public health training program and not relegated to incompetent hands on the grounds that it is beneath the dignity of an academic institution.

Finally, may I stress the vital importance of the highest academic standards in any public health training program. It would seem unnecessary to point out that, dependent upon the various levels at which training is to be given, the academic standards should be the same as for other professions. Yet the personnel shortages are so great and the demand for personnel

so insistent that some have suggested lower standards as a means of attracting persons into public health work. Nothing could be more shortsighted, for the lowering of academic standards would automatically result in a deterioration in the professional quality of work and deter persons of real ability from seeking careers in public health.

What is needed today in all countries is an elevation of professional standards so that public health will attract the highest quality of personnel. Only in this way will we be able to provide personnel of the quality needed to carry on the manifold responsibilities of the program.

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### Meeting World Health Problems, 3

## The Need for Public Understanding and Support

By A. W. DENT, LL.D.

Public health as the science and practice of preventing disease and infirmity through community efforts has developed slowly over the centuries, beginning first with quarantine laws as the barrier device to protect a well community from the invasion of epidemic disease carried by a sick person. Not very long ago some cities actually prohibited any newcomer from entering the gates until he had lived outside for a prescribed period, to prove that he was not sick nor likely to become sick.

Today such measures are impracticable. A well man exposed to a virulent form of influenza in New York could, traveling by air,

develop the infectious stage a few days later in India and conceivably continue on through Japan to San Francisco back to New York before being hospitalized, spreading the virus en route.

Moreover, mosquitoes, which carry many diseases, are unable to recognize quarantine. Some years ago the world's worst malaria vector, *Anopheles gambiae*, was found in Brazil, having been imported from Africa. It was eradicated from Brazil by the Rockefeller Foundation at a cost of millions of dollars. Dr. Raymond Fosdick has suggested that it might be cheaper to eradicate or control mosquitoes in populous areas of Africa than to rely on quarantine measures to prevent their introduction into new areas.

Obviously, public health programs need more than the enforcement of regulations to be successful: an educational effort is as necessary as the provision of safe drinking water or the sanitary protection of the food supply. People

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*Dr. Dent is president of Dillard University, New Orleans. He was a member of the United States delegation to the First World Health Assembly in 1948, and is now a member of the steering committee of the National Citizens Committee for the World Health Organization.*

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need an educational program which teaches the fundamental principles relating to protection of the health of themselves, their families, and their friends, and which will interest them in acting on this knowledge.

### Development of Health Education

The first efforts in health education of the public might be described as the logical progression from the kind of language appearing on quarantine placards to a venture into the advertising field. Posters and pamphlets exhorted and ordered people not to do this or that and warned them against the horrors of various diseases. Health propaganda was the term used in those days and it is interesting to note that in many parts of the world today, particularly where there is much illiteracy, using graphic "propaganda for health" is still common practice.

But people do not like to follow orders blindly, and, this fact being noted by health educators, the next step was to take the public into closer confidence and explain the reasons for the orders, which now became recommendations. The principle that the major purpose of health education is to close the gap between scientific knowledge and its application in daily life was formalized. Obviously, if a sufficient degree of application of the knowledge of hygiene could be attained today by everyone, the public health millennium might be at hand. Unfortunately, however, there are many obstacles in the way: in the United States, movies, radio, television, automobile, hobbies, and the job of earning a living; in underdeveloped countries, illiteracy, religious practices and prejudices, the task of eking out an existence, and political unrest. The health educator must find means to overcome such obstacles, a task that can be done.

It is not enough, however, to make health knowledge available; the individual has to decide for himself to accept such knowledge and make it part of his way of life. As the physician, through the concept of psychosomatic medicine, has rediscovered the patient, so the public health worker has rediscovered the public he serves by the realization that people are best helped through understanding how to help themselves. So the third step in the develop-

ment of public health education is now being taken through the eminently practical concept of citizen partnership in the public health program.

The entry of the citizen as a participating partner in public health planning and action may have come about in the following way.

Public health programs cost money, and fairly early it became common practice for the health educator to explain the program to the public, point with pride to achievements, and view with alarm the unmet health needs of the community. He used his public as a channel for interpretation to all the people, and he harnessed the power of teams of volunteer workers as campaigners and contributors. But, finally admitted to the inner sanctum, the public has not chosen to leave.

The silent partner who provided the where-withal is becoming potentially a very vocal and intelligent participating partner, and on the farm, in the villages, the counties, and cities he is the flesh and bone of citizen health councils. Here is the newest tool to break through the shell of apathy. As more and more people join together to study their health needs and work out programs to meet these needs through community effort, they will be subject to the strongest incentives to make the application of health knowledge part of their way of life. To many health workers, helping to bring this about is one of the greatest challenges in the public health field today.

No, the goal of the modern health educator is not "to tell something to the people," nor is it "to work out a solution with the people." His objective is to help people to work out their own solutions to their health problems.

### Citizen Participation in the World Community

Let us now turn to the wider scene—what local communities are doing, the world community can do. Ideally, what is needed is genuine citizen participation in the planning and work of the United Nations, participation by citizens of every country on the globe. I believe no one will disagree with this thought.

Here I wish to quote from a recent speech by Dr. Frank Boudreau, entitled "Our Stake in World Health," which he delivered at the an-

nual meeting of the American Public Health Association in San Francisco last October.

... Since its establishment the United Nations has been ceaselessly engaged in a desperate struggle to prevent the spread of war. Its attention has of necessity been concentrated on the prevention of aggression, the policing of the world. I realize that police forces are essential even in our most advanced cities. But peace is never a product of police forces alone. It is the fruit of mature minds in a healthy social and economic environment. I do not mean to decry the activities of the Security Council and the Assembly when I say that the real work of the United Nations is the organization of peace. Peace might be built, little by little, if men could be persuaded that the building of peace is just as important as the prevention of aggression. For police action may detect and punish the criminal, but rooting out the causes of crime is a task for other forces.

Economic and social development is needed to heal a sick world and set it on its feet. We have in the United Nations and the specialized agencies all the machinery needed for this purpose . . .

What are these specialized agencies of the United Nations to which Dr. Boudreau refers? There are 10 of them, including the United Nations Educational, Scientific, and Cultural Organization; the World Health Organization; the Food and Agriculture Organization; the International Labor Organization; the International Bank for Reconstruction and Development; and the Interim Commission of the International Trade Organization.

These are autonomous organizations with their own constitutions, legislative and executive bodies, budgets and secretariats, cooperating with the UN and with each other, and seeking to carry out chapter IX of the UN Charter calling for international action to promote economic and social progress. To their number should be added the United Nations International Children's Emergency Fund, an integral part of UN, which in its program cooperates with the specialized agencies.

We are all aware that public health is not an independent cause and that, to achieve better living conditions, people need to make progress simultaneously in several basic fields—in health, in education, in food production and nutrition, in transportation, in communication, and in the development of purchasing power. The Honorable Willard Thorp, Assistant Secretary of State for Economic Affairs, has remarked: "People who are sickly and weak

cannot produce efficiently and have little interest in learning. People who are poorly fed are more susceptible to disease and indifferent to education. People who are ignorant will not readily understand the reasons for sanitation and better farming practices."

Planting good seed and raising good stock are parts of the total program. WHO teams in India and Thailand have found that one of the best steps they can take is to get children to plant vegetable gardens. Engineers in Bengal found that with malaria under control the farmers in an area were able to produce 543 pounds more rice per acre. In many countries, building a system of good roads will raise the living standard more than any other single step. Trade can grow, labor can move about, food can be distributed. Dr. Winslow has reported that killing all the intestinal parasites flourishing inside the people on a Caribbean island would automatically double the food supply available to these people.

### Citizen Councils

The work of the specialized agencies needs the understanding and support of citizens in all countries. The National Commission for UNESCO has led the way in the United States. At the Third World Health Assembly the delegates unanimously adopted a resolution urging the creation in their respective countries of citizen groups to build understanding and support for the work of the World Health Organization. Such groups have been formed in Finland, Austria, Japan, and Canada, and last October the National Health Council—the agency which is working with local and State health councils throughout the United States—announced the launching of a National Citizens Committee for the World Health Organization with the endorsement of the American Association for the United Nations—

... to increase through educational efforts public knowledge concerning the work of the World Health Organization, appreciation of the importance of international health programs, and understanding of the relation of public health issues involved to the general welfare of the world community. . .

These citizen groups should not be confused with the official agencies charged with the re-

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## To be solved . . . . . Education of the Public in Health and Hygiene

- *What educational activities can aid in developing health programs and in moving people to act for their better health?*
  - *What influences have the social and religious traditions of a people on the success of a health program? Can cultural anthropology contribute to planning a sound health program?*
  - *What techniques has the health educator for working in creative cooperation with the people served?*
  - *What is the goal of public health education in world health programs—to tell something to the people, or to help them work out solutions to their problems?*
  - *What may be learned by the United States from the programs of group thinking and mutual cooperation as applied by the WHO?*
- 

sponsibility of cooperating with WHO in administering technical public health programs in their respective countries. The task of these groups is to cause people to appreciate their stake in world health as of immediate concern to themselves and their families and to involve them to the limits of their abilities in doing their share in raising the standard of health throughout the world. Potentially, this can be one of the most tremendous health education endeavors ever contemplated!

Therefore, let us in conclusion revise the title of this paper to "The Need for Public Under-

standing, Support, and Participation in Meeting World Health Problems." I have mentioned the National Citizens Committee for WHO. Here is an opportunity and responsibility for Americans to take up partnership in the work for world health. What should be the full purpose and activities of this committee? What should be its membership and how should it be organized? What should be its relationship with our governmental agencies, with WHO, and, in time, with similar citizen groups in other countries?

## Meeting World Health Problems, 4

# The Need for Money Resources

By FRANK G. BOUDREAU, M.D.

The task of answering the questions on the need for money resources should have been assigned to a hard-headed business man. Since I have accepted the assignment, however, I have no recourse except to do my best.

1. *How much money is now available for promoting the cause of world health?*

The draft budget of WHO reveals that in 1951 the regular budget was approximately 6.75 million dollars; in 1952, 7.9 million; and for

1953, the amount requested is 8.67 million. To these amounts should be added funds for technical assistance and the cost of needed supplies and equipment which must be imported. Grand totals would then be in 1951, 12.75 million dollars; in 1952, 22.33 million; and, in 1953, 24.33 million.

The Director-General of the World Health Organization points out that these amounts would not permit WHO to provide all the tech-



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*Dr. Boudreau, executive director of the Milbank Memorial Fund, was president of the League of Nations Association, 1939-44, and is now chairman of the steering committee of the National Citizens Committee for the World Health Organization.*

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nical assistance that governments have requested, and would fall far short of meeting the need for such assistance.

Other official and some voluntary international agencies expend funds on health activities. The United Nations Relief and Rehabilitation Agency set the example by expending 168 million dollars on health activities and the procurement of medical and sanitation supplies. The United Nations International Children's Emergency Fund is said to have spent or allocated about 162 million dollars in 5 years.

Funds for international health work are also provided by such national agencies as the Friends Service Committee, the Rockefeller Foundation, the Carnegie Corporation, the Commonwealth Fund, the Milbank Memorial Fund, and perhaps others.

Individual governments make outright contributions (in addition to their dues as members) or provide matching funds when they receive technical assistance.

We do not have anything like an accurate estimate of the amount of money now available for world health. For purposes of discussion I would guess—but it is a mere guess—that the total may reach 100 million dollars a year. However, we do know that far more funds are now available for world health than ever before.

WHO's present budget may be compared with that of the Health Organization of the League of Nations in its best year, plus the budgets of the Pan American Sanitary Bureau and the Office Internationale d'Hygiène Publique. These amounted to less than half a million a year.

2. *How much money could profitably be spent in the health field in the next 5 years, in view of limitations involved in program planning, available personnel, and receptiveness on the part of the people concerned?*

Let me deal first with these supposed limitations. Much more basic information for pro-

gram planning is available than is now being utilized. Intensive studies of malaria in India have been carried on for years. It would be an understatement to say that the information derived from these studies has not been fully utilized. The major health problem in underdeveloped countries is frequently an epidemic disease. Little time or energy is needed in planning for the prevention of such diseases. We need only to apply the knowledge we have.

Although even advanced countries need additional expert staff as is shown by the difficulty in filling high positions in the public health services, two things should be borne in mind: First, never in history have such large numbers of trained health officers been available; second, in underdeveloped countries wise use of trained staff, supplemented by large numbers of ordinary workers, will to a great extent overcome the deficiency. Methods and procedures necessary to prevent epidemic diseases are often simple enough to be learned in a few days by ordinary workers. Spraying with DDT, drainage and sanitation work, and immunization are examples.

Experience with the League of Nations has taught me that health administrations and universities are willing to allow members of their staffs leaves of absence for 1 month to 2 years for work in foreign countries under the auspices of an accredited international agency. Programs of social and economic development, including health programs, must as a rule be carried out by the people of the country concerned. Foreigners cannot assume responsibility because of their ignorance of the language, customs, and psychology of the people, but experts can help train local workers and aid in planning and supervision.

The lack of receptiveness on the part of the people concerned is not always difficult to overcome. If a foreigner tries to modify the way of life of an illiterate native, he may fail. But surely the foreign expert will work through the people of the country concerned—the individuals who must in the long run be responsible for carrying out the program.

Natives without formal education may be far more receptive to educational programs than is generally believed. One season's antimalarial, anti-kala-azar work by a WHO team



in a rural district of Pakistan cost about 17 cents per capita. It was effective in increasing the rice crop yield and in reducing sickness and death rates. A canvass of 360 families in the district showed that 80 percent of the family heads were willing to contribute about 11 cents per head per year for the continuation of the work.

I now come to the main question. How much money could profitably be spent in this field in the next 5 years?

Believing that the best way to spend funds for world health is to place such funds at the disposal of WHO I restrict my answer to expenditures of that organization.

My guess would be that a minimum of a billion and a half dollars could be spent usefully by WHO and its regional bureaus in the next 5 years. I exclude from this figure capital expenditures for waterworks, filter plants, drainage schemes, and other similar items.

Increasing fractions of this total could be used to good advantage as experience and maturity are gained.

*3. Should funds for health personnel, the training of personnel, and the provision of materials (such as DDT and penicillin) be supplemented by capital funds for permanent investment in such enterprises as waterworks and drainage schemes?*

This brings up the problem of short-range versus long-range programs. An anti-epidemic campaign which is not followed up may do more harm than good. But peoples who bear the burden of malaria, smallpox, dysentery, cholera, typhus and typhoid fevers long to be free of these scourges. The first step in a long-range program may well be a sharp anti-epidemic campaign to reduce sickness, deaths, and the economic waste due to unemployment because of disability, as well as heavy costs of medical treatment and funerals.

Such short-term programs must be steps in long-range plans for economic and social development, and these will require capital funds for permanent investment in drainage schemes, water supplies, and power development.

*4. Through what agencies can funds for public health best be spent (WHO, the technical assistance programs, etc., or through direct bilateral agreements between countries)?*

The growing desire on the part of the more advanced peoples to help their neighbors is one of the most heartening trends of our time. The desire is manifested by action through international and national, official and voluntary agencies. The present need is so great that all funds, from whatever source, can be used to good advantage. On the one hand, the value of pioneering explorations and demonstrations by private agencies, which often open the way for official action, must not be overlooked. On the other hand, comprehensive plans for economic and social development, including health, can be carried out most effectively by the UN and the specialized agencies.

WHO is a partnership. Members have equal status and an equal voice in decisions. The member country receiving aid has a vote; its point of view is represented; there is no feeling of an inferior people receiving charity from a rich neighbor. Just as important is the fact that WHO speaks for the world and is concerned with world health.

WHO has the very considerable advantage of being able to bring a variety of experience to bear on the health problems of any country. Experience in a highly industrialized nation may not be of the greatest value in one just emerging from primitive conditions. The experience of a nation which has recently emerged from this state may teach more useful and more readily applicable lessons. All varieties and stages of experience are represented.

On the other hand, I believe that the method of bilateral agreements has the greatest disadvantages, for the history of these is linked with empire building and the creation of political spheres of influence. A country which offers to help another is suspected of having other than purely altruistic motives. Moreover the receiving country may not feel free to differ with its philanthropic neighbor, to express its own views, to maintain national policies which, however reasonable, may offend the government from which it receives aid. It may feel it is not a free partner in a joint enterprise. It is a natural, but in my view, a mistaken policy to tie up technical assistance with political advantages, no matter how reasonable and sound.

I have already pointed out that assistance through a bilateral arrangement lacks that

variety of experience which is found in an international agency and may therefore be less suitable and less effective.

It must never be forgotten that technical development may bring disaster if it is partial or one-sided. Campaigns to prevent epidemics may succeed, but if nothing is done to promote political, social, and economic development, the final result may be that larger numbers of people live in greater misery. Or if the only attempt is to provide greater supplies of raw material to be processed elsewhere, the people of the region will not be helped but hindered. There must be advance on all fronts. This requires the formulation and carrying out of comprehensive plans embracing all important aspects of development.

The United Nations and the specialized agencies include the most important social and economic fields of work. This international machinery was built for the purpose of promoting social and economic progress in underdeveloped regions. It is to these agencies that we must turn for planning, general direction, and supervision of the entire program.

5. *What should be the share of the United States of America in financing world health?*

The World Health Organization has decided that not over one-third of its direct budget should come from any one country (but indirect grants for technical assistance, which may be assigned to WHO, and grants to its regional offices are not limited).

If, as I believe, an important principle of the foreign policy of the United States is that peace and prosperity will be brought closer by helping underdeveloped countries and regions to help themselves, then the United States contribution to WHO should be based upon what we believe WHO is capable of achieving in spearheading the movement for comprehensive social and economic development. In deciding on the size of its contribution the Government should take into account:

That health is the least controversial subject for international cooperation, since it involves no element of competition. More health in Asia means not less but more health in other countries as well.

That international cooperation in health matters has had a highly successful record.

That modern methods permit rapid control of many of the epidemic diseases which impoverish countries and from which the peoples of such countries long to be delivered.

That preventable illness and premature deaths often have disastrous effects on the economy of a region as well as on the psychology of the people.

That in the field of health, men of different races and creeds work easily together for objectives in which all men believe and which are of benefit to all.

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## **To be solved . . . . . Assembly and Allocation of Funds for World Health**

- *How much money could profitably be spent in this field during the next 5 years, in view of limitations involved in program planning, available personnel, and receptiveness on the part of the people concerned?*
- *Should funds for health personnel, the training of personnel, and provision of materials be supplemented by capital funds for permanent investment in such enterprises as water-works, drainage schemes, hospitals, and the like?*
- *Through what agencies can funds for international public health best be spent—through the United Nations and other multilateral channels or through direct bilateral agreements between one country and another?*
- *What should be the share of the United States in financing world health activities?*

# International Technical Assistance in Public Health

a portfolio of maps and pictures



**F**AMINE, ignorance, disease have been endured for centuries by great numbers of people in many parts of the world.

During recent decades—especially since World War II—there has been a growing awareness that improvement is both possible and imperative for the benefit of the entire world community. The idea of Point IV—the neighborly sharing of techniques and resources—epitomizes the new outlook and finds practical expression in a variety of international technical assistance efforts.

In this portfolio, *Public Health Reports* sketches the scope and character of the health assistance programs, bilateral and multilateral.

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## The Objectives of the United States

**1947** "The purposes are to further the general welfare of, and to strengthen friendship and understanding among, the peoples of the American Republics through collaboration with other governments . . . in planning, initiating, assisting, financing, administering, and executing technical programs and projects, especially in the fields of public health, sanitation, agriculture, and education."

—from section 2 of Public Law 369, 80th Congress, creating the Institute of Inter-American Affairs

**1948** "It is declared to be the policy of the people of the United States to encourage these countries through a joint organization to exert sustained common efforts . . . which will speedily achieve that economic cooperation in Europe which is essential for lasting peace and prosperity. . . . To sustain and strengthen principles of individual liberty, free institutions, and genuine independence . . . through assistance to those countries which participate in a joint recovery program based upon self-help and mutual cooperation."

—from section 102 of Public Law 472, 80th Congress, creating the Economic Cooperation Administration

**1950** "The peoples of the United States and other nations have a common interest in the freedom and in the economic and social progress of all peoples. Such progress can further secure the growth of democratic ways of life, the expansion of mutually beneficial commerce, the development of internal understanding and good-will, and the maintenance of world peace.

"It is declared to be the policy of the United States to aid in the efforts of the peoples of economically underdeveloped areas to develop their resources and improve their working and living conditions by encouraging the exchange of technical knowledge and skills and the flow of investment capital to countries which provide conditions under which such technical assistance and capital can effectively and constructively contribute to raising standards of living, creating new sources of wealth, increasing productivity, and expanding purchasing power."

—from sections 402 and 403 of Public Law 535, 81st Congress, establishing the Technical Cooperation Administration to carry out the objectives of the Point IV program

**1951** "The Congress declares it to be the purpose of this Act to maintain the security and to promote the foreign policy of the United States by authorizing military, economic, and technical assistance to friendly countries to strengthen the mutual security and individual and collective defenses of the free world, to develop their resources in the interest of their security and independence and the national interest of the United States, and to facilitate the effective participation of those countries in the United Nations system for collective security."

—from section 2 of Public Law 165, 82d Congress, establishing the Mutual Security Agency and carrying forward the economic and technical cooperation programs



## The Multilateral Approach

Through the United Nations the concept of international health has found its most potent means of expression. The multilateral approach to public health—in which the resources of many nations are mobilized for the common good—is found in the programs of the specialized and other organs of the United Nations. Among these are the International Labor Organization (ILO), the Food and Agriculture Organization (FAO), and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). There are two agencies directly concerned with health: The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF).

• • •

Aiming at "the attainment by all the peoples of the highest possible level of health," WHO acts as the

international health coordinating authority; assists governments, upon request, in strengthening health services; furnishes technical assistance and, in emergencies, aid upon the request or acceptance of governments; stimulates the eradication of epidemic and other diseases; promotes maternal and child health and welfare; fosters activities in the field of mental health; and maintains administrative and technical services, including epidemiological and statistical services.

• • •

The United Nations International Children's Emergency Fund is an international cooperative on behalf of children. It draws upon those nations able to help with money, goods, and services and distributes aid to countries on the basis of children's needs which cannot be met from the countries' own resources. In doing

so, it works with and through governments, the latter carrying the full responsibility for administration. The United States participates in UNICEF.

UNICEF provides assistance to countries for general maternal and child welfare purposes, including the building of basic services, training of child welfare personnel, mass campaigns against diseases that particularly affect large numbers of children, milk conservation projects, and in the meeting of emergency situations of special groups in particular need.

Other intergovernmental organizations which are concerned with health activities are: Pan American Sanitary Bureau, the Caribbean Commission, the South Pacific Commission, the Colombo Plan for Co-operative Economic Development in South and Southeast Asia, and the Commission for Technical Cooperation in Africa South of the Sahara.

## The Bilateral Approach

The United States—having emerged from World War II with its economic position stronger than other countries and in a position of international public trust—has made significant contributions of funds and technical assistance to other countries to aid in economic recovery and establishment of greater stability throughout the world.

This nation actively participated in the creation of the World Health Organization as a specialized agency of the United Nations. By Congressional resolution, approved by the President on June 14, 1948, the United States became a member. Through the WHO we substantially contribute to its multilateral programs. And in carrying out bilateral programs, the United States looks constantly to the WHO for leadership and guidance, recognizing the coordinating authority given in its constitution, to which this Nation is a party.

United States experience with the bilateral approach—a direct arrangement between two nations—had its first trials in the health field during the last war through the Office of the Coordinator of Inter-American Affairs. In 1946, came the Philippine Rehabilitation Act. The Eightieth Congress created the Institute of Inter-American Affairs (IIAA) and in the Foreign Assistance Act of 1948 established the Economic Cooperation Administration (ECA)—instituting a far-reaching program with a direct and immediate impact on health conditions. The Act for International Development in 1950 set up the Technical Cooperation Administration (TCA) in the Department of State to develop the Point IV program. The Mutual Security Act of 1951 carries forward the economic and technical cooperation activities of this country.

United States technical assistance appropriations for the fiscal year

1952 are in the range of 400 million dollars, about 10 percent being applied to bilateral technical assistance in health. Programs aimed at strengthening national and local health services are now operating or under development in 41 countries upon requests of governments.

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The bilateral health assistance programs of the United States are coordinated under the general supervision of the Director of Mutual Security in the Executive Office of the President. The two major operating agencies are the Mutual Security Agency (MSA—successor to the Economic Cooperation Administration) and the Technical Cooperation Administration. The Institute of Inter-American Affairs is a functional part of TCA. The Public Health Service of the Federal Security Agency supplies technical support and much of the health personnel for both programs.

# Europe



## Technical Assistance in Public Health










**M**ANY countries of Europe have health problems which affect their national economic development. For this reason, the World Health Organization, during its last assembly, decided to establish a regional office for Europe. Because of the advanced development of health affairs in Europe, the United States is giving technical assistance to only two countries—Greece and Turkey—in a bilateral program.

The present Greek program was initiated in 1947 as a part of the American Mission for Aid to Greece. It was designed to help in the economic recovery of Greece by controlling those diseases which affect the health of workers or make areas of the country unsuitable for agricultural production. Consequently, malaria control was one of the biggest tasks when the program began. This program was carried out on a large scale by the public health division and the agricultural division of the Economic Cooperation Administration (ECA) mission to Greece. Once a major health and economic problem, malaria is now reduced to a minor problem in Greece.

The ECA—now Mutual Security Administration—mission to Greece is now providing advisory services to the Greek Ministry of Hygiene in helping to reorganize its structure and to plan public health programs which will extend into the provinces. In addition to developing health centers in the provinces, the mission is building hospitals, promoting nursing education programs, developing hundreds of community water supplies, and supervising the procurement and distribution of medical stores, drugs, and chemicals. Together with WHO, the Greek Government, and the Danish Red Cross, the mission is also operating a tuberculosis control and BCG vaccination program.

In Turkey, a small United States mission, comprising four persons, is giving assistance in malaria control. The activities of the mission are centered in those regions where rice production was stopped by the Turkish Government because of an increase in malaria. This

### SYMBOLS FOR PROGRAMS

	Malaria and/or other Insect Borne Diseases
	Tuberculosis
	Venereal Disease, Yaws, Bajol, and/or Pinta
	Maternal and/or Child Health, and/or Nutrition
	Rural Sanitation
	Public Health Training and Facilities
	Public Health Demonstration Teams and/or Administrative Services
	Hospital Facilities and Services
	Laboratory and/or Research

team also serves the Government in a general advisory capacity on other health problems.

Because of the high degree of development in the field of health in Europe, the WHO has very few technical assistance missions such as those assigned to the underdeveloped countries. Such assistance as is being given is confined to short-term seminars and demonstrations. WHO, along with the United Nations International Children's Emergency Fund, however, has been instrumental in initiating extensive BCG vaccination programs in the war-ravaged areas of central and eastern Europe.

An international antivenereal disease commission of the Rhine was created in 1951 to coordinate services of the five countries bordering on the river and to establish diagnostic and treatment centers at principal river ports.

A training center for anesthesiology, opened in Copenhagen in May 1950, is being operated by the Danish State Medical Board, the University of Copenhagen, and the WHO. Training in new techniques is being given to specialists from Sweden, Norway, Finland, Iceland, Yugoslavia, and Austria, as well as from Denmark. The first class was graduated in 1951.

A WHO team of six Swedish heart specialists demonstrated new surgical procedures, such as "blue baby" operations, in Vienna and Zagreb. Following the team's visits, cardiac clinics for children were scheduled to be established.





Two school children follow the example of the AMAG poster which encourages children to drink milk.



Student nurses train in ECA-constructed schools under supervision of public health teams.



A new wing is added to this hospital as part of the general construction plan.



When AMAG arrived conditions such as this were common. As many as 14 people lived in these two floorless 1-room huts.

## *Hospitals, Nurses for Greece*

At the end of World War II, many of the countries in Europe were left with hospitals and schools torn and damaged. In Greece, especially, the need for adequate medical facilities was great, for the country became involved in a civil war shortly after World War II. In 1947, the United States assigned the American Mission for Aid to Greece (AMAG) to provide technical and financial assistance requested by the Greek Government, and in July 1948, ECA was assigned to take over and further the work of AMAG and to aid in the establishment and operation of a health program for Greece.

The agreement between the United States and Greece included projects for the training of Greek nurses, and for the construction and improvement of hospitals, sanatoriums, and nursing schools in Greece. By mid-1951, five new buildings were in use: two public health centers; a tuberculosis sanatorium at Sparte; a medical supply warehouse at Athens; and the Greek Red Cross Nurses' School in Athens. It is expected that two new schools of nursing will be opened during the present year, one at Salonica and a school for practical nurses at Laikon Hospital, Athens.

The additional nursing facilities resulting from the construction of nurses' homes have been responsible for an increase in the number of women entering the field of nursing. The number of nursing students increased about two and one-half times in the period from 1945 to 1951.

As a result of the high standards introduced into the field of nursing by the ECA public health mission, greater recognition is being given to graduate nurses, hospitals are placing graduate nurses on their staffs, and the number of graduate nurses has been increasing, until, by the middle of 1951, there were 891 graduate nurses in the country.





Close-up of latrine excavation operations.



One of the new latrine shelters.

### *Sanitation Primary Aim in Iran*

A major problem in the Middle East is that of providing an adequate and safe water supply for the population. Coupled with this is the need for sanitary disposal facilities. In Iran, this problem is receiving the attention of the public health division of the Technical Cooperation Administration.

Under the direction of American sanitary engineers and their Iranian counterparts, sanitation projects, providing safe water supplies and waste disposal facilities, are in operation. These projects are part of a general rural improvement program which is raising the living and health standards of the population. Eventually the entire program will be completely staffed and operated by Iranians.

The location of the first sanitation project was in the village of Kamalabad, about 37 miles northwest of Teheran. In this village of 500 population, a well was drilled at the school and a sanitary latrine constructed. At present, a public bath is nearing completion.

One of the primary aims of the sanitation program is to increase the number of individual and community latrines. Latrine tops adapted to the mores of the people are being manufactured in Teheran for TCA and distributed to those villages which agree to install and maintain them according to direction. These latrine tops

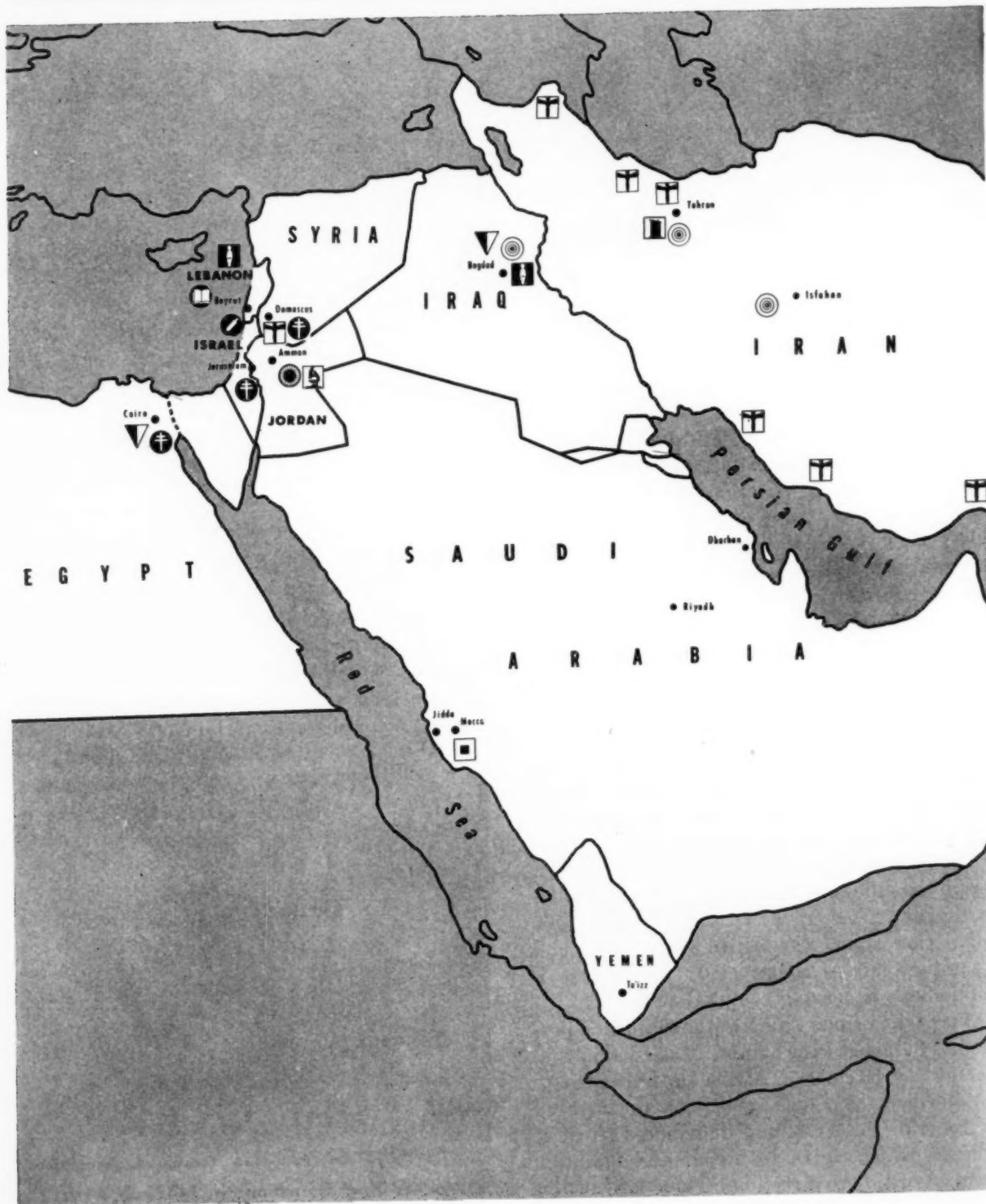
have been built with colorful mosaic tops, with the expectation that their decorative appearance will provide an additional incentive for cleanliness in maintenance.

Because of the great need for safe water in Iran, it is considered essential that water supply facilities be constructed before additional health work is begun. Therefore, plans for the future include the drilling and equipping of 500 deep wells in 1952, and the development of an additional 1,500 wells in the following 3 years.



Well-drilling operations in Ali Shah Avez.

# Middle East



## Technical Assistance in Public Health

**B**ORDERING the southeastern shores of the Mediterranean Sea and extending south to the Sahara Desert and east to the Caspian Sea and the Persian Gulf is an area of the world often referred to as the Middle East.

A major problem of this area is the movement of population—refugees, immigrants, and pilgrims. There are hundreds of thousands of homeless Palestine refugees temporarily settled in Lebanon, Syria, and Jordan. Immigrants continue to flow into Israel. Every year, 200,000 Moslems make their pilgrimages to Mecca in Saudi Arabia. These movements have far-reaching political, social, and economic importance, including their effect on disease transmission.












These are among the reasons the United States and the United Nations agencies are channeling much of their technical assistance to the countries in this area. The United Nations International Children's Emergency Fund and the World Health Organization are supplying medical personnel and supplies to stave off epidemics among refugees. One hundred and forty-eight thousand refugee children have been vaccinated against tuberculosis. Control programs against malaria, typhus, and other insect-borne diseases are carried on by these international organizations in the refugee camps.

Infectious eye diseases, such as trachoma, are being attacked in Jordan. With United States equipment and technical direction the Government of Jordan has set up a central laboratory to provide essential laboratory services required in attacking the problems of communicable diseases in that country.

The Saudi Arabian Government, with WHO assistance, has built quarantine facilities at Jidda to control diseases among the pilgrims.

UNICEF and WHO are sponsoring vaccination programs throughout the area for protection against tuberculosis. In Israel, 208,000 children have been vaccinated, while in Egypt some two million children and young adults have been tested. A vaccine production

### SYMBOLS FOR PROGRAMS

	Malaria and/or other Insect Borne Diseases
	Tuberculosis
	Venereal Disease, Yaws, Bejel, and/or Pinta
	Maternal and/or Child Health, and/or Nutrition
	Rural Sanitation
	Public Health Training and Facilities
	Immunization
	Trachoma, and/or other Infectious Eye Diseases
	Laboratory and/or Research
	Public Health Demonstration Teams and/or Administrative Services
	Quarantine

center is being established in Cairo with the assistance of WHO and UNICEF.

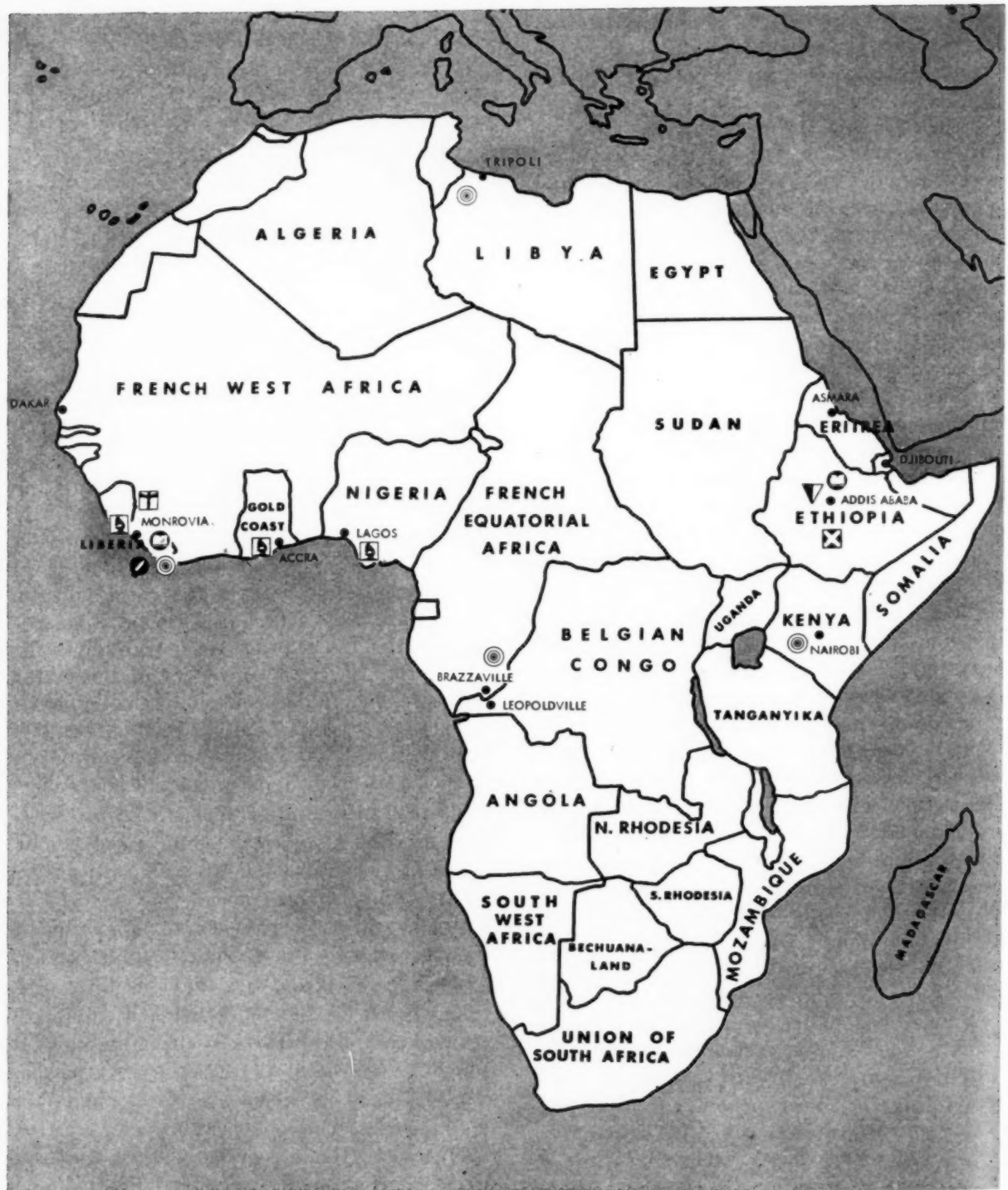
The Maternal and Child Health Center in Beirut is training local maternal and child health teams for work in the rural villages. The United States Technical Cooperation Administration has helped to set up training facilities at the American University of Beirut for subprofessional and professional public health workers from all the nations in this area.

WHO and UNICEF also bring medical care to thousands of men and women in Iraq suffering from bejel, syphilis, and other spirochetal diseases. TCA is establishing rural public health demonstrations in areas of Iraq undergoing economic development.

For the first time, the rural population of Iran is receiving the benefits of public health, scientific agriculture, and fundamental education. In each of the provinces, or ostans, a team of technical experts is setting up regional health centers as part of the TCA program. These centers are serving as focal points for training subprofessional health workers. Also, TCA and WHO, in cooperation with the Ministry of Health, are very rapidly bringing malaria under control in Iran.



# Africa





## Technical Assistance in Public Health

**A**FRICA, the second largest continent of the world, has only 15.1 people per square mile, compared with North America's 22.1, Asia's 72.6, and Europe's 142.0. In the central part of the continent is a region many times greater in area than either the pampas regions of South America or the prairies of the United States, which is rich in natural resources. But much of it at present is virtually uninhabitable. If made safe for human habitation, this region could supply much of the needed food for the world.








Most of the diseases known to man are found in Africa. Particularly prevalent are malaria and African sleeping sickness. Smallpox, typhus, epidemic meningitis, yellow fever, hookworm disease, and malnutrition are also widespread. In some of the drier areas of the continent, trachoma, a disease often causing blindness, strikes as many as two out of every three inhabitants. Along the coast, syphilis and gonorrhea have invaded the towns and villages. In the interior, yaws incapacitates both children and adults.

The prevalence of these diseases not only hinders the development of Africa, but also presents possible threats to health in other areas of the world, since many of the diseases may be, and have been known to be, transported to other countries. Man has discovered methods for the control of most of the diseases, but the economic cost of applying such measures on a large scale remains a formidable barrier.

The United States is presently giving technical assistance on health problems to two countries in Africa—Liberia and Ethiopia—under a bilateral program.

In Liberia, the bilateral program has been in operation since 1944. Originally initiated as a wartime operation to protect American military personnel stationed in that country, the program is now an integrated part of the public health services of Liberia. The American staff of the mission is assigned to responsible positions in the national health service. Ameri-

### SYMBOLS FOR PROGRAMS

	Malaria and/or other Insect Borne Diseases
	Venereal Disease, Yaws, Bejel, and/or Pinta
	Public Health Training and Facilities
	Immunization
	Laboratory and/or Research
	Public Health Demonstration Teams and/or Administrative Services
	Leprosy

can experts provide assistance in nursing education, malaria control, and laboratory services, as well as in rural sanitation and other types of health services. At the request of the Liberian Government, the World Health Organization has provided a consultant to draft and codify health regulations. WHO is also providing personnel to undertake a yaws control program in that country.

WHO has been providing assistance to Ethiopia for several years. Due to the extreme shortage of trained personnel in the health fields, the program has been restricted primarily to the training of subprofessional personnel. Recently, however, the country has received assistance from WHO in leprosy control, and a project for the control of venereal disease has been approved. The Technical Cooperation Administration has approved the assignment of a public health administrator to Ethiopia to plan a national health service for that country. It is anticipated that additional personnel will be assigned to Ethiopia when a plan has been agreed upon.

Other important health activities in this region include a malaria survey in Sierra Leone and epidemiological studies in the Gold Coast and Nigeria, which have been sponsored by the Mutual Security Agency.

WHO has recently established a regional office for Africa at Brazzaville, French Equatorial Africa.



A class at the Tubman School of Nursing.



Midwives receive instruction in prenatal care.



Native midwife plans new nursing home.

## Liberia Trains Midwives and Nurses

Midwifery in Liberia, as in many countries in the world, is an important phase of the health program since virtually all Liberian babies are delivered by midwives. The United States Public Health Service Mission in the capital city of Monrovia, which was established in 1944 at the request of the Liberian Government, almost immediately began elementary training for midwives. Classes filled up quickly at the mission and other classes were started in nearby villages in response to eager demands.

After learning improved techniques in midwifery, the tribal midwives return to their own villages, where they use their new skills in delivering babies either in their own homes or in special places prepared for this purpose.

One of the midwives, from the Bassa tribe, who has been working in the clinics of the Public Health Service Mission in Monrovia for the past 2 years, is hoping to open a small nursing home in her village, where she may take her patients for deliveries. At present she is using her own home. She plans to christen her new nursing home "SMALL USPHS" in appreciation for the training and other help she has received from the mission. Among her people, she is considered a "big woman" and her influence has been strengthened by the guidance she has received at the mission.

A major milestone in the training of midwives was the opening of a 2½-year course in midwifery at the Tubman School of Nursing in Monrovia in March 1951. This course offers training in the basic principles of prenatal and postnatal care, newer and improved delivery techniques, and patient and infant care. Nineteen students are presently enrolled in the course.

The Tubman School of Nursing, a cooperative project of the United States and Liberia, was established in 1946 to help solve Liberia's problem of providing professionally trained health people. The school offers a training program which meets nurse training standards in the United States and other countries. Its 23 graduates to date (1948-51) are now serving as clinical and public health nurses in various parts of Liberia.



**Patients registering prior to examination—part of the venereal disease control program.**



**A woman and her child undergoing a routine blood test for syphilis.**

## ***Penicillin Comes to India***

In the early months of 1949, at the request of the Government of India, the World Health Organization established a venereal disease demonstration team in the Himachal Pradesh, the foothills of the Himalayas. In this area, which has a population of about one million, the problem of syphilis was severe. The team, consisting of a physician, serologist, public health nurse, and health educator, had its headquarters at Simla, the largest city in the area.

Shortly after the arrival of the first member of the WHO team, the Indian matching-team leader was assigned. The existing laboratory at Simla was found to be adequate for the clinical work and testing that was necessary, and work was begun there. The team was quite successful in introducing penicillin therapy to the region. Local physicians and hospitals quickly accepted this method, as well as team-demonstrated techniques for serologic tests for syphilis.

The primary function of the venereal disease control team was the training of local doctors and other health personnel who could continue the work after the team's departure. In the first 17 months of activity, 29 persons had completed training under direction of the team. These trainees, in turn, have assisted in the training of additional health personnel, and have initiated venereal disease control measures in the various hospitals and clinics in India. The success of the team in this phase of their work indicates that a program begun with outside assistance and direction can be absorbed into the provincial health services of a country.



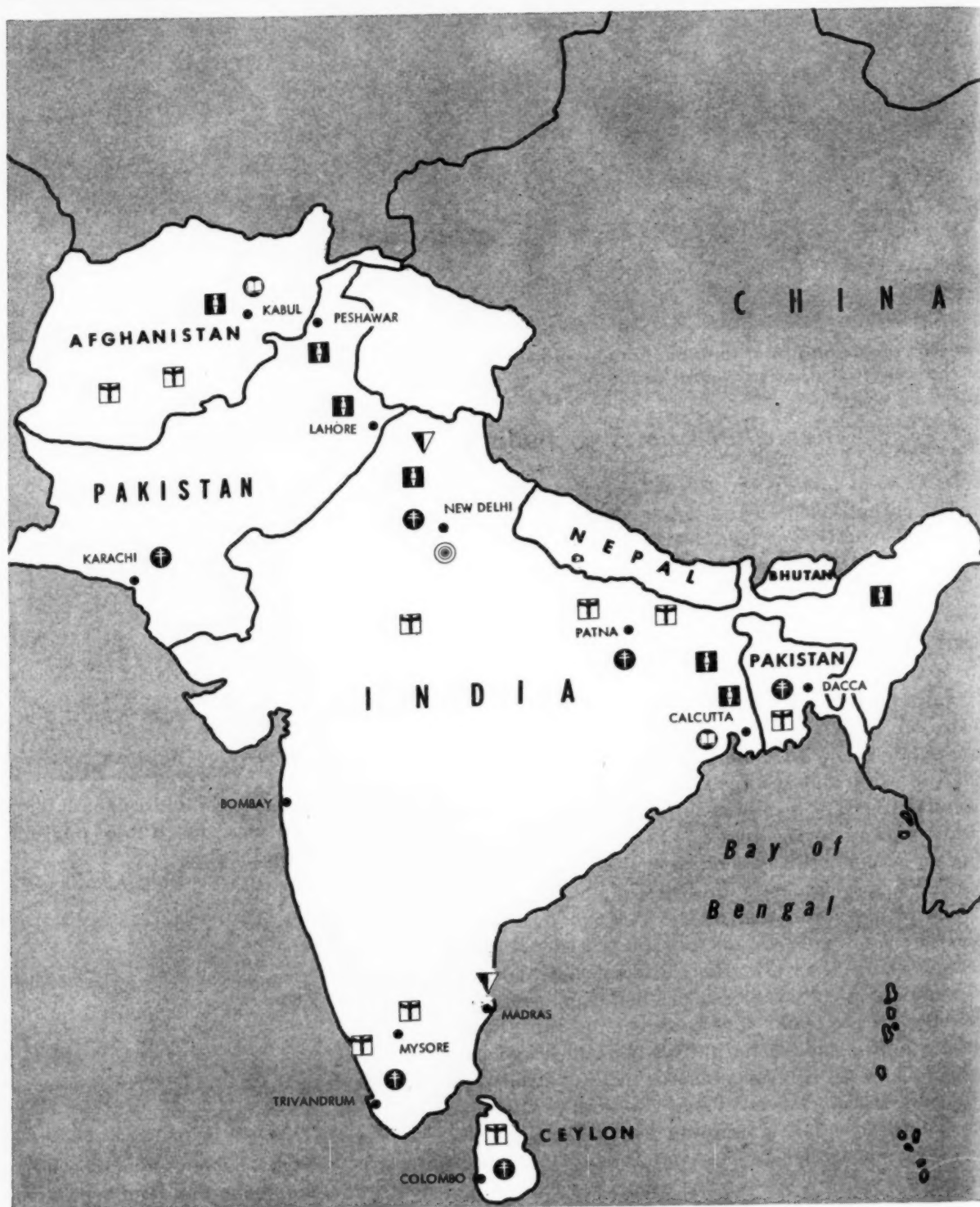
**A venereal disease control team preparing for a trip into the Ghund region.**



**A typical work table used in the examining and treatment room.**



# South Asia











## Technical Assistance in Public Health

**M**ORE than 400,000,000 people inhabit that area of South Asia politically divided into the states of Afghanistan, Pakistan, India, Nepal, and Ceylon. These people are of many races, religions, and castes. Equally varied are the topographic and climatic conditions, ranging from the intense cold of the Himalayan Mountains in northern India and the barren plateaus of Afghanistan to the humid tropical lowlands of Ceylon. All of these people have one thing in common—untold human suffering resulting from ill health and undernourishment. The limited fertility of the soil and the rapid population growth present serious obstacles to the social and economic development. Many of the resources of the United Nations organizations are devoted to this area. Also, the United States has allotted considerable funds for technical assistance to these countries. The Technical Cooperation Administration has assigned a public health administrator to India to assist in developing specific projects for countries in this area.

The United Nations organizations have been operating in this area for several years and have a number of programs under way. In Afghanistan, the World Health Organization and the United Nations International Children's Emergency Fund have combined to establish basic maternal and child health services and training facilities for nurses and midwives. During the past year, the WHO assisted the Government of Afghanistan with two malaria control demonstrations, reducing the infection rate among children in the controlled areas by over 50 percent.

After 2 years of work in Simla, India, during which time 40 local venereal disease teams were trained, the WHO venereal disease control team has been assigned to the Madras area to set up a similar clinic and laboratory training center.

Jointly with the Food and Agriculture Organization, WHO has operated malaria control projects in four districts of India (Uttar Pra-

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	Public Health Training and Facilities
	Public Health Demonstration Teams and/or Administrative Services

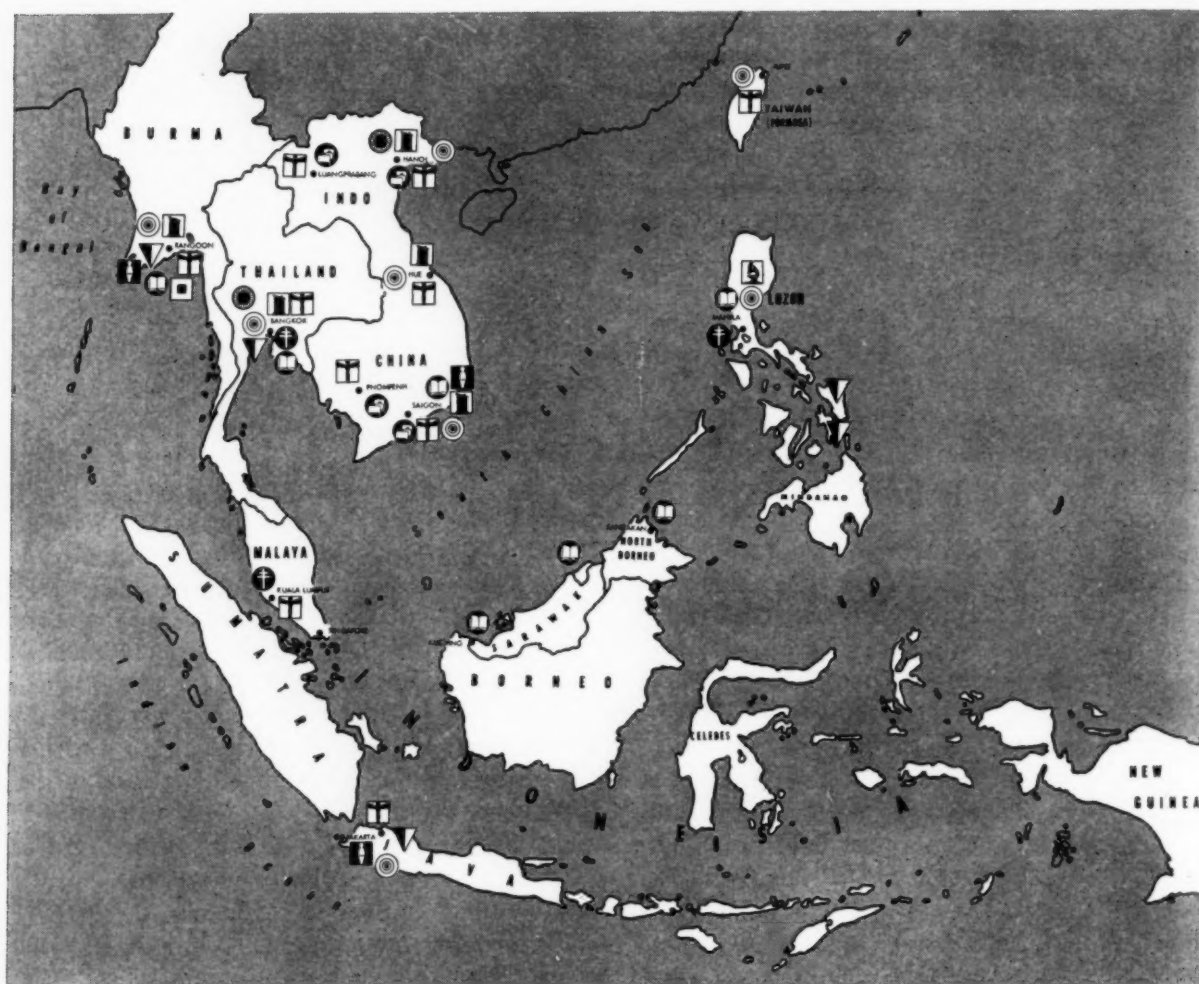
desh, Orissa, Mysore, and Malabar) and has trained 100 local teams to carry on malaria control activities.

Tuberculosis training centers have been opened in Delhi, Patna, and Trivandrum, and more than 4,000,000 Indian children have been tuberculin tested. WHO and UNICEF are assisting the Government of India in developing, in Calcutta, a maternal and child health center as part of the All-India Institute. This center will provide subprofessional and professional undergraduate and graduate training in preventive medicine, obstetrics, and pediatrics. From those who have completed this training will come the personnel to be used in expanding the 100 maternal and child health centers and the three pediatrics training centers which have already been set up in India.

In order to expand and strengthen the 100 maternal and child health centers in Pakistan, WHO and UNICEF have established five maternal and child health training centers for midwives and nurses and have provided the technical staff, supplies, and equipment for the centers in Lahore, Karachi, and Peshawar. The malaria control demonstration work in East Pakistan, which reached 250,000 persons, is being expanded to reach 1,000,000 people. A nation-wide BCG program centered at Karachi and Dacca, is being undertaken.

The WHO/UNICEF program in Ceylon has focused on malaria control and tuberculosis vaccination. The DDT residual spraying program, started several years ago by the Ceylonese Government, has been very effective.

# Southeast Asia



**S**OUTHEAST ASIA is probably the most complex of the regions which are receiving technical assistance in health. This peninsular region extends from the under side of China to thousands of small islands known as the East Indies and the Philippines. Eight independent nations—Burma, Thailand, Viet-Nam, Cambodia, Laos, Formosa, Indonesia, the Philippines—one dominion, Malaya, and a number of non-self-governing territories occupy this area.

The United States is devoting intensive efforts to relieve the suffering of the people in this area and to assist the governments to develop sound economies which can include sup-

port for adequate health services.

In Indochina, where the French and Viet-Nam Governments are still fighting Communist rebels, relief and care for civilian casualties and war refugees necessarily constitute a considerable part of the health program. Fifteen American experts supervise malaria control teams, operate trachoma clinics, direct the drilling of wells and the building of privies in the villages, train and supervise first-aid workers, laboratory technicians, dressers, and other subprofessional personnel, and provide the technical guidance for the construction and equipping of hospitals.

## Technical Assistance in Public Health












In Thailand, American experts are assisting the Ministry of Health in venereal disease, malaria, trachoma, and plague control programs, rural sanitation, and professional education. WHO and UNICEF have initiated a 3-year yaws control program and are assisting in malaria and tuberculosis control.

American personnel with the United States Health Mission in Burma have been successful in carrying preventive medicine to the areas outside the major cities. Venereal disease and malaria control teams have been trained and assigned to rural areas. Quarantine personnel have been trained. A nation-wide program in environmental sanitation is getting under way. American personnel serve as instructors at the Rangoon Medical School and Hospital. WHO and UNICEF are planning an extensive maternal and child health program in cooperation with the Government of Burma.

In Indonesia the small American public health group is providing advisory services to the Ministry of Health and assisting with the malaria control program carried on by the three malaria institutes. WHO and UNICEF are assisting in equipping 250 maternal and child health centers and are training personnel to staff these centers.

A nation-wide yaws eradication campaign carried on by WHO and UNICEF has resulted in treatment for more than 100,000 persons.

United States technical assistance in public health for the Philippine Islands is in the plan-

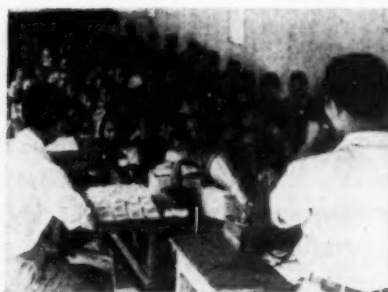
SYMBOLS FOR PROGRAMS	
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	Public Health Demonstration Teams and/or Administrative Services
	Hospital Facilities and Services
	Quarantine

ning stage. However, WHO and UNICEF have established a rural training center and are carrying out extensive yaws and syphilis control programs in Leyte and Samar. A BCG production laboratory and a tuberculosis demonstration center have been established at Santa Cruz near Manila.

In Formosa the United States is assisting in the malaria control program and is providing advisory services to the government.

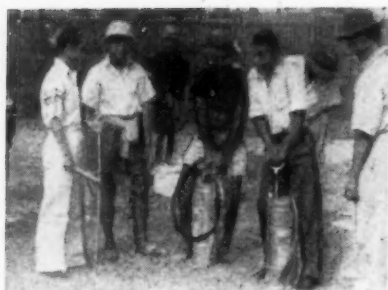
WHO has assigned public health nurses to Brunei, North Borneo, and Sarawak to strengthen the nursing institutions in these countries. In Malaya WHO is sponsoring malaria control programs and extensive BCG vaccination campaigns.

**Malaria control activities in Thailand include blood tests, explanation of the program to school children, and supplying of aralen tablets. (Prints from a Mutual Security Agency film.)**





## ***DDT, Aralen, Education, Fight Malaria in Thailand***



**A local DDT spraying team is readying its equipment.**



**Here the team is carrying the equipment to one of the villages.**



**The people welcome the spraying team to the village.**



**The spraying team in action at one of the houses.**

In Thailand, as in all of Southeast Asia, malaria is a major cause of death. Approximately 50,000 deaths due to malaria—about 20 percent of the total number of deaths—are reported annually. In addition, there are many more thousands of persons in the country who are partially or completely incapacitated and unable to work due to the ravages of this disease.

Malaria control activities began in April 1951 in the northern provinces of Chiangmai, Lampang, and Chiangrai. These activities were a part of the public health program established by the Thai Government with the assistance of an ECA public health mission, which was sent to Thailand in February 1951. ECA supplied DDT, spray equipment, jeeps, and aralen tablets, and Thai personnel carried out the spraying operations.

In a 3-week period, 400 Thai field personnel sprayed more than 40,000 houses with DDT. During this period, two ECA public health experts, a malariologist and an entomologist, were assigned to the northern provinces to assist, in an advisory capacity, the Thai malaria control officers.

An evaluation study was initiated in June 1951, to determine the accomplishments of the 1951 DDT house-spraying campaign and to develop plans for an extensive residual-spraying program during the 1952 malaria season. These plans include spraying activities to cover an area having some 1,400,000 persons.

The development and initiation of a program for the distribution of aralen tablets was less rapid than was the residual-spraying campaign. This was due to the desire of the public health mission to include as much village participation as possible, still making certain that aralen would reach all those who needed it in areas where spraying activities were going on. However, by August 1951, the distribution of aralen became routine field work in regions where malaria control teams were doing evaluation studies. At the end of August, approximately 20,000 aralen tablets were administered in the Province of Chiangmai, and a total of 200,000 aralen tablets were distributed in the five areas under study by the evaluation teams. Aralen is also being distributed as part of the trachoma control program, with the aim of reaching as many malaria sufferers as possible.

Much of the public health staff's malaria control activities during the latter part of 1951 were coordinated with the activities of the Thai Government to enable it to plan in full the 1952 antimalaria campaign. In addition to control measures for 1952, long-range plans include malaria control activities which should reach approximately 5,000,000 people within the next 5 years. As malaria control work becomes more firmly established, Thai personnel are taking over much of its supervision and direction. The aim of the public health mission is to enable the Thai Government to take over the malaria control program completely in as short a time as possible.





Men carrying pipe for the water system in Tierra Colorado, as part of the town's contribution to the project.



Water supply tank in Oaxaca.

## *Mexico Strives for Safe Water*

Mexico's need for a supply of safe water was ably expressed in 1948 by the Mexican Minister of Hydraulic Resources, Adolfo Orive Alba: "Water supply and sewerage services in our cities are very important when we consider that 22 percent of the general mortality is caused by water-borne disease, due principally to the use of contaminated water for domestic purposes . . . ."

Water supply systems and facilities for sewage disposal thus constitute some of the most important projects carried on by the United States (Institute of Inter-American Affairs)-Mexican Cooperative Health Service.

A typical project to provide a water supply and distribution system was carried out in the town of Tierra Colorada, Guerrero. This town had no public water supply other than an open canal which brought water from the Huayapa River. As part of their contribution to the project, the town agreed to furnish the unskilled labor and to transport material from the nearest railroad station, 135 miles away. The completed project consisted of a detention dam and intake structure, a conduction line to a water storage tank and from there to the distribution system installed in the town, a chlorinator installed at the water storage tank, and a distribution system.

In 1940 only about 700 of the 115,000 towns in Mexico had water service, and of these, only about 5 had really potable water because, though there were some 20 treatment plants, most of them were deficient. The cooperative health service has provided 28 towns with water supply systems and currently has 21 projects under construction.

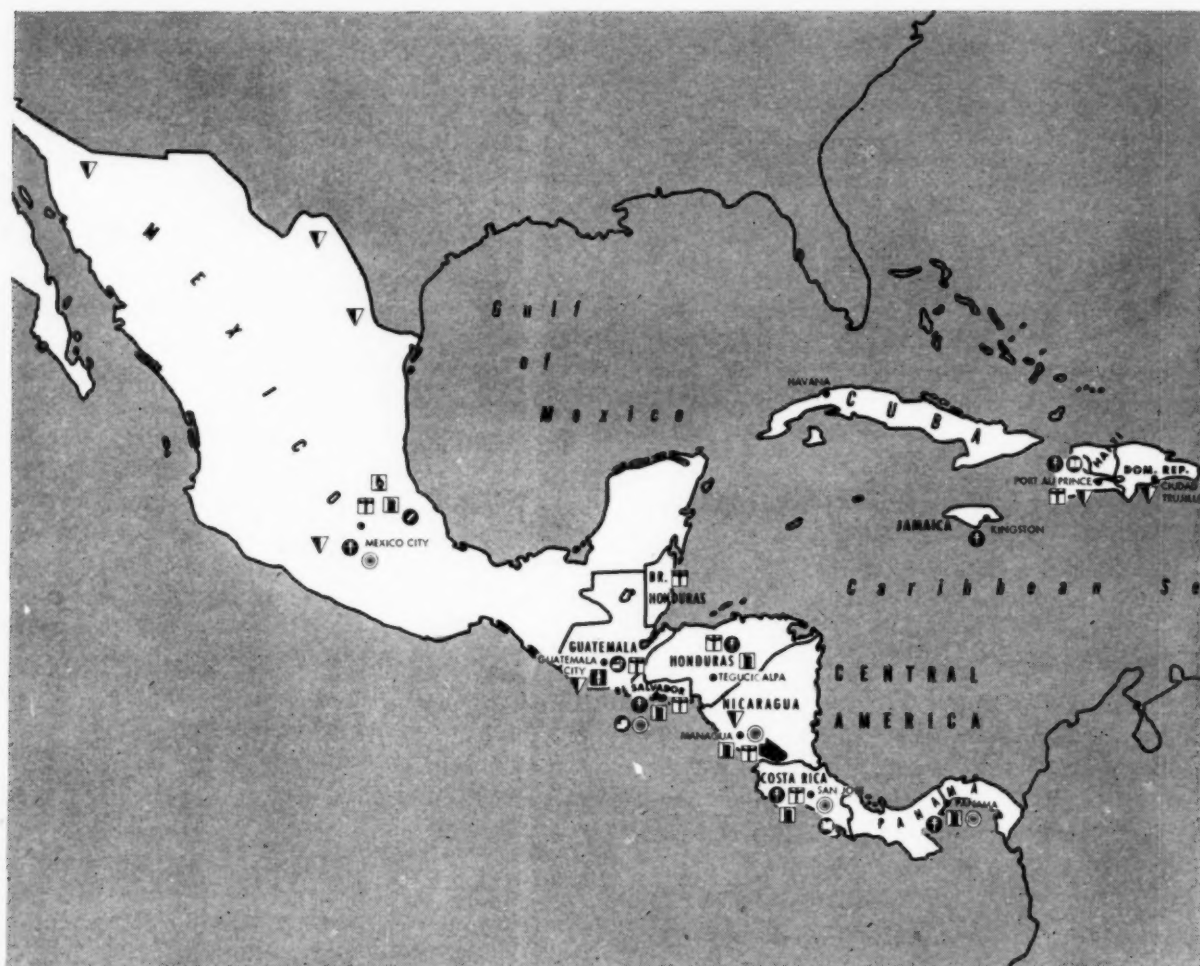


Plaques commemorate projects.



A typical public hydrant.

# Caribbean Area



## SYMBOLS FOR PROGRAMS

- Malaria and/or other Insect Borne Diseases
- Tuberculosis
- Venereal Disease, Yaws, Bejel, and/or Pinta
- Maternal and/or Child Health, and/or Nutrition
- Rural Sanitation
- Public Health Training and Facilities
- Immunization
- Laboratory and/or Research
- Public Health Demonstration Teams and/or Administrative Services
- Hospital Facilities and Services

THROUGH the Institute of Inter-American Affairs, the United States is cooperating directly with the governments of the various countries in Central America and the Caribbean area in carrying out health programs. The programs are being administered by cooperative government agencies known as "Servicios," which are staffed jointly by personnel from the United States and nationals of the host country and are financed by contributions from the United States and the host government. In all cases the host government supplies by far the major portion of both personnel and funds. Eight countries in this area are participating.

## Technical Assistance in Public Health

In Costa Rica, the health program includes a project for the construction of sanitary privies, technical support to the Department of Sanitary Engineering in the Ministry of Public Health, and, jointly with the World Health Organization (Pan American Sanitary Bureau), financial assistance to the National School of Nursing.

Current activities in El Salvador include the completion and partial equipping of two hospital-health centers, a tuberculosis pavilion, and a nursing school, and the supervision of an extensive rural sanitation project emphasizing safe water supplies and sewerage systems.

The objective of the Guatemalan program is the completion of a 1,000-bed hospital and medical center on the outskirts of Guatemala City, for which Guatemala is furnishing the funds.

Major emphasis in Haiti is being placed on extensive campaigns aimed at the control of yaws and malaria, the two outstanding health problems of the country. Assistance is being given the control operations through clinics and mobile units, and an extensive health education activity is being carried out. Other current activities include the operation of a health center, technical guidance to the National School of Nursing, construction of additions to the water supply system of the capital city, and general cooperation with the Hydraulic Service of the Haitian Government in a program aimed at improving community water supplies.

The principal activities in Honduras now include malaria control operations, the construction of water and sewerage systems, and technical assistance in the operation of a national tuberculosis sanatorium in Tegucigalpa.

Since its beginning in 1942, the program in Mexico has placed special emphasis on the construction of water supply and sewerage systems. Other current activities include technical assistance to Servicio-constructed health centers, country-wide campaigns to control malaria, rickettsial diseases, tuberculosis, pinta, brucellosis, and Rocky Mountain spotted fever, as well as an extensive project to control venereal dis-

eases along the United States-Mexican border and smallpox in the Tepalcatepec River basin.

The program in Nicaragua was reactivated in January 1951. Current operations comprise evaluation of previous work, conducting of extensive surveys for water supply and waste disposal projects, and construction of two health centers and two water supply systems.

The Panama program, put back into operation in 1951 after a lapse of 6 years, is carrying on a country-wide health education project and making surveys for sewerage systems. The program also includes the operation of a country-wide BCG vaccination campaign against tuberculosis and technical assistance to the national hospital in Panama City.

The Pan American Sanitary Bureau acts as WHO's regional office for the Americas. It is continuing the campaign for the eradication of the *Aedes aegypti* mosquito, carrier of yellow fever. Joint WHO/UNICEF projects for tuberculosis control have been started in Costa Rica, where a 2-year program calls for tuberculin testing of 260,000 children and BCG vaccination of those not yet infected; in El Salvador, where it is hoped that 877,000 children can be tested and vaccination provided in 2 years; and in Jamaica, where the program calls for testing of 600,000 persons, vaccination, training of local personnel, and extending the services of an existing laboratory. A BCG vaccine laboratory in Mexico City, aided by WHO and UNICEF, produces vaccine both for Mexico and for other Latin American countries.

Campaigns against insect-borne disease are being conducted in Costa Rica, El Salvador, Guatemala, Honduras, British Honduras, and Nicaragua with WHO/UNICEF aid.

A 2-year campaign against yaws was launched in Haiti in 1950 with the cooperation of WHO and UNICEF. Venereal disease projects are being conducted in Nicaragua, Guatemala, and Mexico. The Institute of Nutrition for Central America and Panama was established in Guatemala with the cooperation of the WHO regional office.



## South America





## Technical Assistance in Public Health











THROUGH the Institute of Inter-American Affairs, the United States is carrying on bilateral technical assistance programs in health in nine South American countries. These programs are carried out through cooperative services similar to those used in the Central American countries. These "Servicios" are an integral part of the ministry of health in each country.

The major public health activity in Bolivia is the operation of a series of health centers in six of the country's nine departmental capitals. Other activities include the operation of dispensaries and a central laboratory, the training of personnel for laboratory work in health centers and hospitals, the supervision of country-wide health education projects, and the construction of a maternity hospital and a water supply system.

The cooperative health program in Brazil is centered principally in the Amazon, São Francisco, and Rio Doce Valleys and in the states of Bahia, Paraíba, and Pernambuco. Major activities include the operation of health centers (subposts in remote areas), hospitals, laboratories, and mobile dispensaries on river launches; construction of demonstration water supply systems, laundries, and public baths; state-wide privy construction projects in the states of Amazonas and Pará; studies relating to the incidence and control of yaws, schistosomiasis, and other diseases common in the areas; improvement of public health and hospital nursing services in five states; conducting of extensive health education projects; development of industrial hygiene; and technical assistance in hospital administration.

An important phase of the cooperative health program in Chile is the operation of three health centers serving areas with populations ranging from 30,000 to 80,000. Other activi-

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ties include country-wide campaigns for the control of tuberculosis, typhus, typhoid fever, meningitis, diphtheria, whooping cough, and other diseases which have especially high morbidity rates in Chile. In progress also are a country-wide nutrition project, a technical assistance project in vital statistics, a project in sanitation for the Aconcagua Valley, construction of health centers and several sewerage and water supply systems for small towns, and a country-wide health education project.

Emphasis is being placed in Colombia on the control of malaria in an area with a population of 3,000,000. Nutritional deficiency studies, health centers and yaws control projects, a country-wide health education project, and the operation of the National School of Nursing are other activities of the Servicio. Industrial hygiene activities are being initiated and environmental sanitation projects expanded.

The present public health program in Ecuador is a broad one, involving the control of malaria and yaws, the construction of water supply systems in several small cities, the construction of improved sewerage systems, and on-the-job training of sanitary inspectors and laboratory technicians. Thirty-two hospitals

## Technical Assistance in Public Health

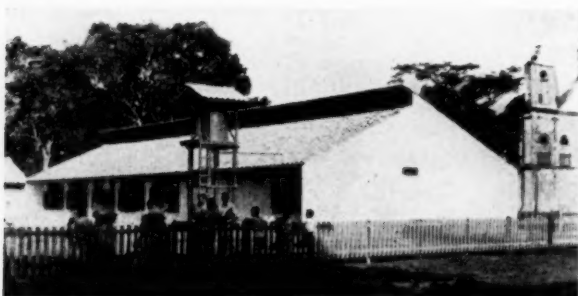
have been constructed and are in use. The Servicio is also the administering authority for an Export-Import Bank loan used for the construction of water supply and sewerage systems.

Current activities in Paraguay include assistance to the leper colony and the operation of health centers, a central laboratory, and a 100-bed tuberculosis sanatorium, which is being expanded to 200 beds.

At the present time, activities in Peru include the operation of health centers, hospitals, dispensaries, medical and sanitary posts, and river launch dispensaries in the jungle area; the study of industrial hygiene problems particularly related to high-altitude mining; the control of yellow fever and leprosy in the Department of Loreto; the study of nutritional deficiency; and a nation-wide health education project.

The cooperative health program for Uruguay has been directed primarily toward the planning, construction, and operation of demonstration health centers in the important towns. The Servicio currently is operating four demonstration health centers. Other activities include a country-wide health education project, a yellow fever project, a tuberculosis project, and technical assistance to the University School of Medicine.

**The public health center in Caméta, Brazil, is 1 of the 21 built in the Amazon Valley.**



The United States-Venezuela cooperative public health program is now limited to two major fields of activity: the provision of small water systems for the many small towns throughout the country and technical assistance to the National School of Nursing.

The threat of yellow fever has been reduced in the Western Hemisphere in the past 4 years by the work of the Pan American Sanitary Bureau, which acts as WHO's regional office for the Americas. In Ecuador, joint WHO/UNICEF projects for tuberculosis control include testing of 1,100,000 children and adolescents, vaccination, and establishment of a vaccine laboratory in Guayaquil. In Peru, a campaign against typhus, which began in Cuzco after an earthquake in May 1950, has been extended, with WHO/UNICEF help, to the entire country. Venereal disease projects are conducted in a number of countries, including Ecuador; Peru, where control in a port area will be demonstrated; Venezuela, where a serologic laboratory and venereal disease training center has been opened in Caracas; and Paraguay.

Immunization of children against diphtheria and whooping cough is under way in Chile and Colombia. In La Paz, Bolivia, the country's first children's hospital is being erected with technical aid by WHO and UNICEF.

**This combined hospital and health center was built by the United States-Brazilian Cooperative Health Service in Santarém, Brazil.**



## Health Programs Reduce Death Rate In Brazil's Jungles

In the region of the Amazon River, the United States (Institute of Inter-American Affairs)-Brazilian cooperative health program has produced some almost miraculous results. Disease and poverty in this jungle area have been rampant for centuries. Before the program began in 1942, there were, according to some Brazilian estimates, as many as 8,000,000 cases of malaria a year. Intestinal parasites victimized thousands of people. The death rate was almost unbelievably high.

An important part of the program to improve health conditions in the Amazon Valley is being carried on by the 27 public health centers which have been set up in various villages by the cooperative health service. These health centers have specialized clinics for expectant mothers, for tuberculosis, for dental care, and for venereal disease. They provide consultation and treatment for those in need of these particular types of public medical service. They carry out immunization programs against specific diseases, including smallpox, typhoid fever, diphtheria, whooping cough, and tuberculosis.

Each health center usually has on its staff a group of visiting nurse's aides who go out into the homes of the service area on daily rounds to bring advice and consultation, particularly on problems of child care and family nutrition. These nurse's aides have many and varied duties to perform in this area where doctors and trained nurses are few. They take blood samples, care for women during labor, give instructions on child care, and set broken bones. One of their most difficult tasks is to talk the people out of their fear of hospitals.

The health centers frequently have a staff of public health inspectors who make periodic check-ups on sanitary conditions in the markets, the restaurants, and other public places where food is sold or handled.

One of these public health centers is located in Caméta, a jungle village of 3,000 people. The results of the health program in this village have been particularly dramatic. The yearly death rate used to be 200 out of every 1,000.



**The visiting nurse of the United States-Brazilian Cooperative Health Service provides a link between the health center and the homes.**

By 1948, the rate was down to 90 per 1,000, and in 1949 it slid down to 70.

The health center in Caméta, opened in 1945, is staffed with a physician, a trained nurse, a pharmacist, three visiting nurse's aides, a sanitary guard, and a laboratory technician—all of them Brazilians. In 1949 the center treated, without charge, 19,727 patients, gave 5,417 injections, and filled 27,340 prescriptions.

Another important activity of the Cooperative Health Service in Brazil is the fight against malaria. The town of Breves, a village of about 900 people located 100 miles up the Amazon River, offers a good example of the results of the antimalaria campaigns. In 1945, this village was so saturated with malaria that the river boats would not stop there. That year DDT spraying activities were begun, and since that date the town has been sprayed twice a year. Today there is not a case of malaria in the town. The boats are stopping again, and the village has resumed shipping out rubber and lumber.

The health program in Brazil is being financed jointly by that country and the United States, Brazil furnishing nine-tenths of the funds and the United States one-tenth.



# The Work of the World Health Organization Expert Committees

*In the conviction that our readers would find useful a review of the work of some of the expert committees of the World Health Organization, Public Health Reports asked leading authorities in this country who have participated in committee deliberations to report briefly on the activities of the committees. The editors are grateful for these contributions.*

*As described in the "Technical Reports Series" of WHO:*

*"Expert advisory panels and committees are an essential part of the machinery of WHO. Their purposes and functions are to provide the organization with technical advice on a particular subject.*

*"The Director-General has authority to establish expert advisory panels and to select and appoint their members, who undertake to contribute by correspondence and without remuneration technical information*

*or reports on developments within their own subjects; they serve in their personal capacity and not as representatives of governments, institutions, organizations, or other bodies.*

*"Members of expert committees are selected by the Director-General from the panels, the choice being governed by the agenda of each session.*

*"The selection of members of both expert advisory panels and committees 'shall be based primarily upon their ability and technical experience,' and 'due regard shall be paid to adequate geographical distribution.'*

*"Reports of expert committees express the corporate views of the members and are of basic importance as guides to the organization in the development of policies and programs. They do not, however, of themselves commit the organization to any policy or action; nor do they necessarily express the views of the organization. The publication of reports of expert committees is authorized by the Executive Board."*

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## Environmental Sanitation

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The significance of environmental sanitation as a process for alleviating disease on a world-wide basis was given a high priority among the First World Health Assembly's immediate objectives. The assembly early recognized that the failure to control man's physical environment or the inadequacy of implementing its regulation brings major deleterious effects to the majority of the population of the world.

The World Health Organization convened, therefore, the first session of its Expert Committee on Environmental Sanitation to delineate the functional areas in which sanitation should evidence the greatest results at a minimum of cost. The committee realized that in nearly all the countries of the world deficiencies in sanitary practice were major causes of disability and death and that progress in correction might be slow because of inadequate resources both of money and of professional personnel. Emphasis was placed upon (1) encouraging the early participation of professional engineers in governmental health activities; (2) giving high priority to the training of sanitation experts; (3) arousing the interest of national administra-

tions in the development of sanitation programs and in the modes of financing them; (4) demonstrating by WHO the coordination of environmental sanitation with other health activities in current assignments; and (5) the developing of demonstration teams having both technological and educational objectives.

Significant progress on these fronts has already taken place despite long and extensive delays which essentially represent processes of education of both medical officer and engineer. The kind of practice that has grown up in sanitation in the United States, the United Kingdom, and a few other areas serves, perhaps, no more than 20 percent of the population of the world. The translation and adaptation of these values to the cultures, practices, and structures of other countries is a slow evolutionary process. Since none of these activities are the exclusive professional province of any one group, the integration of sanitation work into the team objective of medical officer, nurse, and laboratory worker offered early challenges. More and more in each country, the medical officer's concept has become wider

and deeper, and his natural leadership of team activity has been extended to the acceptance of more engineering sanitation participation.

However, the mere handful of sanitary engineers in the world (probably not more than 10,000) could not be expected to provide the leadership essential for these activities in a world population of more than 2 billion without developing on all fronts almost every gradation of professional and subprofessional sanitation worker.

A second committee session was therefore convened in October 1951 to devote its attention to the specific problem of the education, training, and utilization of personnel for environmental sanitation. The report of this committee proposed qualifications, training, and functions for engineers, plant operators, specialists, industrial hygiene personnel, sanitarians, and voluntary lay leaders. It re-emphasized the great desirability of maximum teamwork with the medical officer of health, the nurse, the health visitor, and other personnel engaged in health other health personnel.

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## Antibiotics

The executive board of the World Health Organization recommended at its third session the establishment of an Expert Committee on Antibiotics to deal with research in antibiotics and various technological problems. This committee held its first meeting in April 1950.

The problems considered were mainly concerned with the production of antibiotics; training and research; feasibility of international conferences on antibiotics; abstracting service; type culture collections; surveys of penicillin requirements; modernization of UNRRA penicillin plants; production of streptomycin; the present position of antibiotics; and development of research in therapeutics.

Design of antibiotic plants and procurement of equipment and personnel presented the main difficulties which prevented certain countries, especially those of eastern and central Europe, and some underdeveloped areas, from producing penicillin and other antibiotics. The committee recommended that WHO assist member states in procuring

essential equipment and that it provide assistance in collaboration with the economic organs of the United Nations to countries unable to obtain the necessary currencies.

The committee also recommended that WHO assist member states to use available training facilities for creating teams of highly trained scientific and microbiological engineers; that WHO grant fellowships for one year or more to persons with a sound knowledge of chemistry, engineering, or microbiology to enable them to take part in research work in antibiotics; and that it negotiate with institutes having appropriate training facilities for acceptance of WHO fellows as participants in their research programs.

Several institutes offered facilities for training such personnel: the Department of Microbiology, Rutgers University, New Jersey; the Department of Biochemistry, University of Wisconsin; the Nobel Institute of Medicine, Stockholm; the University of Oxford, England; and the Istituto Superiore di Sanità, Rome. The first training center has been established

at the latter institute, and a special symposium was held there at the end of June 1951.

The committee proposed the organization of a symposium to discuss primarily the newer antibiotics now finding application in chemotherapy, and the relation of antibiotics to tuberculosis and venereal diseases.

It also recommended that the Expert Committee on Biological Standardization be given support in obtaining international standards and reference preparations for antibiotics which, although in the experimental stage, would appear to be of importance.

Attention was drawn to the unsatisfactory terminology sometimes used in the assay of new antibiotics, and attention of authors and editors of scientific journals was directed to the preference for the use of the term "provisional unit" in place of "unit."

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## Biological Standardization

The work of the Expert Committee on Biological Standardization follows in orderly sequence from Ehrlich's original work in 1894 on the standardization of diphtheria antitoxin. The task of the committee is to re-evaluate and replace the old standards as required and to establish standards for the newer biological substances, such as antibiotics, hormones, and enzymes, as rapidly as they can be characterized. Some means of standardization must be developed before newly discovered substances like adrenocorticotrophic hormone (ACTH) can be introduced into rational therapeutics.

At the fifth session of the committee, held in Geneva in December 1951, steps were taken to improve the old standards, as in the case of diphtheria toxoid, as well as to develop

standards for the newer substances such as the antibiotics and hormones. The scope of the work has expanded greatly from the classical immunological preparations to a wide variety of biological substances, including diagnostic antigens and serums, antibiotics, hormones, and enzymes. In an effort to keep abreast with new developments, steps were taken to establish a collection of authors' preparations.

The scope of the work of the committee was broadened at the request of international organizations interested in veterinary medicine to include certain preparations requiring standardization for use in research and in medical practice in that field. This is a logical development since frequently the same substance, for example tuberculin, serves equally well in both human and veterinary medicine.

Many of the products for which biological standards have been established now appear in the Pharmacopoea Internationalis I, and it is obvious that the two committees concerned must work closely together.

Much remains to be done in biological standardization. For example, there is still no usable reference preparation for as old a product as rabies vaccine. Then, too, research developments in the newer fields with antibiotics, hormones, and enzymes are just getting under way, and standards or reference preparations will be required for the drugs resulting from this research as they come into everyday use in medical practice.

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An expert committee of the World Health Organization and two joint groups of the Food and Agriculture Organization and the World Health Organization have been set up to advise on the control of a group of diseases common to both man and animals.

### Rabies

Treatment with rabies hyperimmune serum combined with a course of vaccine was recommended for field trials in human beings by the WHO Expert Committee on Rabies at its meeting in Geneva in April 1950. Experimental findings show that the serum preceding a course of vaccine gives promise of saving most of the severely exposed human rabies cases in which short incubation time does not allow the development of active immunity.

Iran was designated for the trials. Rabid wolves bit 60 persons in 1949, and 22 persons were bitten during the first 4 months of 1950. These cases are always severe and at least half the victims are bitten in the head and face. The mortality rate exceeds 30 percent despite intensive vaccine treatment. The hyperimmune serum treatment would thus be subject to severe test.

The committee also urged further ecologic studies on vectors of the disease. The existence of asymptomatic carriers was recognized from observations of vampire bats as rabies vectors in South and Central America.

To reduce to a minimum the number of people subjected to antirabic treatment unnecessarily, the committee suggested the following indications for vaccine treatment: A person treated with vaccine and exposed to rabies a second time within 3 months needs no further treatment unless the second exposure is severe; if the interval is between 3 and 6 months, two reinforcing doses of vaccine, 1 week apart, are indicated; if more than 6 months have passed, treatment should be the same as for an original exposure.

Allergic reactions to vaccine treatment, such as fever, shock, angio-neurotic edema and adenopathy may be avoided by changing to a vaccine made from the brain tissue of a different species of animal.

The committee recommended that, where feasible, a biting animal should be observed for 10 days. If the animal shows no signs of illness during this period, it can safely be assumed that it was noninfective.

Where restrictive measures only are used to control rabies, dogs should be confined for at least 90 days, if vaccine is used. This period may be reduced to 30 days after vaccination. The committee recommended that exposed animals be destroyed or isolated for 6 months or, if vaccinated within 12 months of exposure, revaccinated and isolated for 30 days.

In extensive land areas where rabies exists among domestic and wild animals, the committee recognized that quarantine measures are impractical.

### Brucellosis

Strain 19 vaccine was thought the best available to combat brucellosis by the Joint FAO/WHO Expert Panel on Brucellosis which met in Washington, D. C., in November, 1950. This vaccine approaches the ideal as defined by the panel: it confers adequate protection; it is safe, that is, it is dead or relatively avirulent and shows no tendency to increase in virulence in the animal body; it causes a minimum of interference with the seroagglutination test; and it is easy to produce, preserve, and distribute.

In discussing control and eradication procedures for bovine brucellosis, which are based on the elimination of infected animals or vaccination, the panel agreed that the tube seroagglutination test is one of the most reliable methods for detecting infection in individual animals. The rapid plate test is very good, too, when standardized with the tube test. The ring test for milk is

valuable to locate infected herds or milk supplies.

Although the problem was limited, the panel recommended that infected herds of goats, sheep, and swine be slaughtered if the infection was new to the area, as there are no satisfactory vaccines for these animals.

The panel reviewed bacteriological culture and typing of *Brucella* and recommended criteria for final identification. FAO and WHO have established 12 brucellosis centers for control of the disease in animals and man. To stimulate eradication programs, the panel urged the reporting of the disease.

Human brucellosis was discussed by the panel under clinical criteria, diagnostic criteria, and therapy. The value of these subjects was studied before the panel reported their conclusions. Routes of transmission from animals to man were also discussed.

### Zoonoses

More than 80 zoonoses, "those diseases which are naturally transmitted between vertebrate animals and man," including virus, rickettsial, bacterial, fungus, protozoal, helminth, arthropod, and insect diseases, were listed by the Joint WHO/FAO Expert Group on Zoonoses at its 1950 session in Geneva.

### Bovine Tuberculosis

The most important disease problem considered was bovine tuberculosis. The group recommended tests for detection and slaughter as a highly effective method for controlling the disease. Several countries have almost eradicated the disease with this technique.

As a temporary expedient in special circumstances, vaccination was suggested. The limitations of BCG use for cattle are: the animals react to tuberculin for at least 1 year, and this can interfere with the test and slaughter program; the intravenous use of BCG vaccine, as observed in the United Kingdom, may cause undesirable systemic reactions; the large unsightly swellings

which frequently follow subcutaneous use of BCG may be objectionable to the herd owner; and adequate and fresh supplies of the vaccine are frequently difficult to obtain in certain areas and countries.

The group also pointed out the importance of protecting the animals against human carriers and recommended health supervision of milkers and attendants.

### *Q Fever*

The group suggested local and regional surveys to determine the prevalence of Q fever in man and animals; research on diagnostic tests other than the complement-fixation test; immunization of domestic animals, and chemotherapy for man and animals.

### *Anthrax*

To control agricultural outbreaks of anthrax, the group recommended

the establishment of local diagnostic facilities, low-cost or free livestock vaccination, and that rural populations be taught to recognize the early signs of anthrax in man and animals.

### *Psittacosis*

Re-examination of quarantine policies on psittacosis was recommended by the group in the light of new knowledge of wider disease reservoirs, the lower prevalence, and successful use of antibiotics in treatment of human cases. Although the group supported the prohibition of commercial shipments, they suggested easing quarantine regulations for individual pets, rare birds, and breeding stock.

### *Hydatidosis*

Successful control of hydatidosis requires the reduction of the disease

in its animal reservoir, the dog in most cases. Two points for its control were emphasized by the group—eradication of canine infection by anthelmintic treatment and stray dog control, and sanitary animal slaughter and prevention of infection.

Virus encephalitides, leptospirosis, tularemia, bilharziasis, trichinosis, glanders, and salmonellosis were discussed for future action. The group recommended food hygiene problems for early study by WHO and FAO and also recommended the development of international standards for veterinary biological products in conjunction with other groups working on the same problem.

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## Nursing

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The Expert Committee on Nursing was first convened in February 1950 to advise the World Health Assembly on measures to insure the recruitment of nurses in proportion to the needs of each country and to advise on the education of nurses.

The committee recommended that WHO urge each member government to take an inventory of its nursing personnel, including auxiliary nursing personnel, and to estimate the number of each type which would be needed by the developing health programs in each country. A manual was sent to each member government to assist the proper authorities in surveying the nursing resources and needs of the nation. The surveys, the committee hoped, would provide a basis for more specific and long-range planning, and would focus attention on the needs for nurses of all types and on methods for filling the needs.

Attention was called to a few simple principles of nursing education, including the desirability of sound professional leadership and careful selection of students. The committee recommended that WHO

undertake fundamental research with the assistance of social scientists to determine the health needs of people in two or more societies. The results of this study, the committee believed, would serve as a basis for realistic and pertinent designs for nursing education in various countries. It would help avoid duplication of an established pattern, like that of the United States, in countries where the cultural patterns and health developments are vastly different.

The committee noted the opportunity for cross-representation of health disciplines on several committees, including the Expert Committees on Maternal and Child Health and on Professional and Technical Education. It also emphasized the importance of granting fellowships to several types of health workers from one country to provide teams that could work together in that country after study abroad.

The committee's task at its second meeting in October 1951, was to advise on the provision of nursing service and the preparation of nursing personnel in areas of the world where

nursing services are scarce. The importance of the inclusion of health in the "fundamental education" programs of UNESCO and other specialized agencies was discussed. A few examples of nursing service that meet a variety of needs of the people were collected and included in the report, most of them from the countries where health programs in nursing are new aspects of national life.

The committee strongly recommended that, in the schools of nursing in such countries, students be given instruction and experience in teaching and supervising untrained auxiliaries. Nurses graduated from one of these schools, regardless of previous educational background or quality of training, will be expected to assist in establishing health services in situations where no other health workers exist. The committee was concerned with obtaining translations of original work on practical health subjects for use in nursing schools and in community health programs.

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## Drugs Liable to Produce Addiction

The Expert Committee on Drugs Liable to Produce Addiction is advisory through WHO to the United Nations and its Commission on Narcotic Drugs. On the international level it formulates an opinion on the addiction producing properties of a drug and under some circumstances indicates the degree of control to which the drug should be subjected. It also discusses and makes recommendations on general problems in the field of drug addiction. The committee has met three times, in January 1949, 1950, and 1952.

The committee has declared to be addiction producing the drugs methadone, meperidine, and about a dozen derivatives of these synthetic analgesics, and has recommended that, like morphine, they be subjected to international control. A similar recommendation has been made for 3-hydroxy-N-methylmorphinan (Dromoran), its codeine analog, and a number of new morphine derivatives. It has considered also the addiction liability of a number of commercial preparations of morphine-like substances as a basis for continuance or relaxation of their international control.

The committee has drafted definitions of drug addiction and addiction producing drugs on the one hand and of habituation and habit-forming drugs on the other hand, and has

recently appended to these definitions a statement to clarify the distinction it believes can and must be made between these two conditions and the drugs producing them.

Much thought has been given to the gravity of the heroin situation, and the committee is of the opinion that complete abolition of legally produced heroin in the world would greatly facilitate the struggle against illicit use of this substance. On its recommendation the Director-General of WHO has inquired of governments throughout the world why their physicians consider heroin necessary in medical practice. Although in 1949 only 24 nations were known to have discontinued the use of heroin, replies now show that 50 member states of WHO have discontinued or are willing to discontinue the medical use of the drug. This changing attitude on the part of the medical profession prompted the committee to recommend that WHO pose to the remaining nations the direct question, whether or not they could do without heroin in the interest of public health and safety.

The committee has reviewed the increasing use and abuse of barbiturates throughout the world. Barbiturates, the committee believes, must be considered drugs liable to produce addiction and, therefore,

dangerous to public health. It advises that nations take measures to strengthen control of these drugs.

At its first session the committee recommended the establishment of a mechanism for the selection of common nonproprietary names, especially for addiction producing drugs which come under international control. As a result the WHO Expert Committee on the International Pharmacopoeia has set up a Subcommittee on Nonproprietary Names. The names selected are now used by the Permanent Central Opium Board and Drug Supervisory Body in all of their documents, and governments are urged to use these names whenever possible.

Great activity has been shown in recent years in the development of synthetic morphine-like analgesics. So far all of the new substances of merit otherwise have been addiction producing; nevertheless this line of investigation should and will continue. WHO's Expert Committee on Drugs Liable to Produce Addiction will continue to keep the closest watch on developments in this field and must continue to play a most important role in assessing the inherent dangers of all analgesic drugs.

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## Epidemiology and Quarantine

The Expert Committee on International Epidemiology and Quarantine is the Nestor of WHO committees. When the amalgamation of the epidemiological services of the League of Nations, UNRRA, and the Office International d'Hygiène Publique had been recommended by the International Health Conference in New York, the Interim Commission of WHO, at its first session in July 1946, appointed a Committee on Epidemiology and Quarantine. The functions of this committee included supervision of the application

of the international sanitary conventions and of any other measures necessary to check the spread of epidemics across national frontiers.

The responsibilities inherited from UNRRA included the delineation of yellow fever endemic areas and the approval of yellow fever vaccines according to the international sanitary convention of 1944. Subsequently, study groups were set up on cholera, smallpox, plague, and typhus. When WHO became a permanent specialized United Nations agency in 1948, the committee

received the status of a regular expert committee.

Meanwhile it was realized that the existing international quarantine conventions were scientifically outmoded. Furthermore, the failure of many governments to ratify the more recent conventions had brought about a state of confusion in matters relating to quarantine. The First World Health Assembly therefore directed the Expert Committee on International Epidemiology and Quarantine to draft new international sanitary regulations to replace

the existing quarantine conventions.

Draft regulations were prepared by the expert committee in December 1949. The Expert Committees on Insecticides and on Plague, the Study Group on Cholera, and the Yellow Fever Panel had met previously and made valuable contributions. The draft was submitted to governments for comment, and revised by the committee in October 1950 to include a number of the suggestions received. In April 1951, a Special Assembly Committee, consisting of official delegations from member states, met in Geneva for 4 weeks to discuss the revised draft and approve a text. After minor

amendments, this text was unanimously voted by the Fourth World Health Assembly on May 25, 1951. The regulations are to go into effect October 1, 1952.

For the first time in history, uniform quarantine regulations will be applied throughout the world, and an ideal worked for during a whole century will have been attained. Impediments to international traffic for purposes of epidemic control have been limited, and better protection against pestilential diseases has been obtained.

The committee's quarantine section has, among other problems, dealt with complaints from govern-

ments concerning the application of the international sanitary conventions.

The Expert Committee on Plague produced, in 1949, a detailed outline of plague control field work and of procedure in the elimination of reservoirs and vectors of plague in sea and airports.

The Joint ILO/WHO Committee on the Hygiene of Seafarers dealt with subjects not included in the sanitary regulations but, nevertheless, of importance to international travel and transportation.

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## Malaria

The Expert Committee on Malaria in its fourth session held at Kampala, Uganda, December 1950, reaffirmed the policy formulated in its earlier sessions (1947-49) for the World Health Organization. The committee recommended that the highest priority be given to malaria control in any WHO program of technical assistance to highly malarious areas. The committee emphasized the continuing need for active encouragement of malaria control by all means within WHO's province.

The committee recommended that the assignment of malaria control demonstration teams to underdeveloped areas be continued and that these teams be staffed with men engaged on a long-term basis. The term of each team should be of at least 3 years' duration. By these means a reservoir of trained staff would be constantly available. The teams should be sent to areas in which no adequate demonstration of the utility of modern measures of malaria control have as yet been made. One of the chief functions of such teams would be to assist in the development of local organizations and in the training of staff. Short-term field fellowships and travel grants for training in malariology were recommended as more useful than long ones.

The Expert Committee on Malaria

approved the recommendations of the Malaria Conference in Equatorial Africa and recommended that WHO impress on member states and on the Commission for Technical Cooperation in Africa South of the Sahara (CCTA) the importance of implementing these recommendations. WHO with the cooperation of CCTA, where relevant, should establish, the committee felt, an annual malariology course in Africa and offer help to one or more member states which undertake malaria control in large areas where the adult population has a high degree of tolerance to the disease.

The committee agreed with the recommendations of the Expert Committee on Insecticides regarding the method and timing of the disinfection of aircraft and with the composition, dosage, and methods of distributing insecticides in aircraft. It recommended that WHO increase the practical value of the specifications laid down by the insecticides committee for spraying apparatus by preparing specification charts of sprays now on the market.

In the prevention of the spread of anopheline vectors of malaria by international transport, the Expert Committee on Malaria agreed with the Expert Committee on Insecticides on techniques to be employed and recommended that an interna-

tional agreement be sought on the basis of the designation of the international airports according to their degree of infestation rather than on a designation of countries or other large areas in this regard.

The committee reaffirmed its position on measures taken by the Economic and Social Council of the United Nations, the World Health Assembly, and other bodies to promote the free flow of insecticides, insecticidal formulation, raw material and equipment for their manufacture, and the apparatus for their application. It approved the United Nations' suggestion that the best means of implementing the pertinent resolution of the World Health Assembly would be through the medium of an international agreement. The committee emphasized that, as noted in its third report, experience has proved residual spraying to be a measure of major importance. A monograph on therapeutics and revision of malaria nomenclature were recommended.

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*The activities of the Expert Committee on Insecticides will be described in more detail by Dr. Samuel W. Simmons in a paper scheduled for publication in a subsequent issue.*

## Health Statistics

In the past 5 years, outstanding accomplishments have been made in the field of international health statistics. Most notable was the agreement reached at the Sixth International Decennial Conference for the Revision of the International List of Causes of Death (Paris, 1948). This agreement led to the international adoption of a single statistical classification for illness and causes of death.

Scarcely less important was the conference's sweeping five-point proposal, later adopted by the World Health Assembly, for international cooperation in vital and health statistics. These five recommendations and the action that followed them are summarized below.

1. An Expert Committee on Health Statistics was created by the World Health Organization. Three meetings have been held, with these principal results:

At the committee's request, the World Health Organization established a center to adjust problems arising in the application of the international statistical classifica-

tion. This world focal point for clearing this type of problem has been operating since January 1, 1951.

International definitions were established for live birth and foetal death, and the collection of comparable data in this area was stimulated.

Intensive work was done on problems of cancer statistics and hospital statistics.

International needs in the broad aspects of morbidity statistics were reviewed.

2. National Committees on Vital and Health Statistics have been created by 35 member nations. These committees are a powerful force in promoting national health statistics. Moreover, by studying problems referred to them by the expert committee, they provide a channel through which ideas from national sources reach international levels for consideration and action. Thus, a mechanism has been established for assuring direct national participation in solving international problems in health statistics.

3. The recommendation that the World Health Organization develop its statistical service led to creation of a WHO statistical unit that serves not only the needs of WHO but also as a secretariat for the expert committee.

4. The Paris conference recommended occasional international technical conferences on problems in vital and health statistics. At its third meeting, the expert committee proposed that WHO call an International Conference of National Committees on Vital and Health Statistics in the spring of 1953, and suggested items for the agenda.

5. In promoting international health statistics, WHO is cooperating with the interested services of the United Nations and specialized agencies, particularly with the Statistical Office of the United Nations, which has responsibility for collecting vital statistics and establishing vital statistics standards.

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## Maternity Care

The WHO Expert Committee on Maternity Care, meeting in Geneva in November 1951, considered all aspects of maternity care and its importance to the health and well-being of all communities.

The committee endeavored, as far as information was available, to keep clearly in sight the differing stages of economic development in various parts of the world, and the differing needs in this field as well as in other aspects of public health. Although the committee realized that one comprehensive plan cannot be applied in all countries, it agreed on certain standards of maternity care for implementation in stages, over a period of time, in countries where there has been little development. At the same time, the committee considered that the development of maternity care has not always proceeded soundly in the economically more developed

countries. The committee recommendations are designed to serve as a guide to governments instituting this service.

Maternity care is closely linked with existing social, labor, and educational services, and many of these services offered by governmental agencies are needed to supplement any sound program of maternity care. Hence, the committee emphasized that it is important for governments to recognize the desirability of cooperation between such agencies at a national level. The committee stressed also that maternity care should be regarded as an integral and important part of any broad public health program.

The transcendent importance of the training of midwifery personnel, especially for underdeveloped countries, was reviewed at length and a recommendation made to the World

Health Organization that a joint expert committee, composed of members of the advisory panels on nursing and maternal and child health, be convened to give further consideration to the training of midwifery personnel at all levels. Prior to the convening of such a joint committee, information regarding the present patterns of maternity service and the training of personnel will be collected from various countries. This is in keeping with the general recommendation of the committee that the World Health Organization undertake fundamental research to determine the real health needs of peoples and to study, in this connection, the need for maternity care and the way in which it can best be satisfied.

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Upon its organization, the Expert Committee on the International Pharmacopoeia of the World Health Organization drew upon a rich heritage of nearly 50 years of endeavor. Although there was earlier interest in an international pharmacopoeia, the year 1900 saw the first formal action among nations. The resulting Brussels Conferences of 1902 and 1925 and the establishment in 1937 of a Technical Commission of the Health Organization of the League of Nations had the purpose of unification of national pharmacopoeias. Thus, one of the first functioning groups created within the WHO in 1947 was the Expert Committee on the Unification of Pharmacopoeias, which took up the work retarded but not entirely interrupted by the war. It was apparent that achievement of the desired end was most feasible through the preparation of an international pharmacopoeia. Indeed, it was for this reason that the name was changed to the Expert Committee on the International Pharmacopoeia.

Because of the pre-existing groundwork the committee's efforts produced results quickly in the form of volume I of the *Pharmacopoeia Internationalis*, published last October. Volume II is in preparation for release late this year. The two vol-

umes, to be available in English, French, and Spanish, will provide standards of strength, quality, and purity for nearly 300 basic drugs in the forms found useful generally in accepted medical practice. In addition to therapeutic agents, including the antibiotics and other established chemotherapeutic drugs, diagnostic aids and immunological preparations are covered. Numerous appendixes provide the required general pharmaceutical and bacteriological tests and tables of usual and maximal doses for adults and children. Included is the serodiagnostic test for syphilis, using cardiolipin and purified lecithin.

An important aspect of the committee's work is the selection for international adoption of common, nonproprietary names of drugs. This program to eliminate a growing state of confusion among pharmacists and physicians will coordinate the efforts of several national bodies now selecting names for drugs.

Addenda will be issued to volumes I and II of Ph. I. until a complete revision is made. Plans call for a revised edition printed as a single volume about every 5 years. This program will keep the compendium up to date and will insure its continued usefulness, especially to the

great majority of the 79 member states of WHO which do not have a national pharmacopoeia. It will also enhance the value of the Ph. I. to the few countries, such as the United States, England, and France, which now have an active pharmacopoeial revision program.

A book of standards for purity and potency of drugs is essential to any national health program. This principle has been recognized in many countries to the extent that the national pharmacopoeia has legal recognition and is binding upon pharmacists and drug manufacturers. In many of the countries without national pharmacopoeias, the Ph. I. will probably be adopted legally. Elsewhere, independent preparation of national pharmacopoeias has resulted in a lack of uniformity that causes confusion and danger to travelers and is a hindrance in the utilization of scientific information. With the Ph. I. as a model, these inconsistencies will decrease even though the book is not given legal status. These are but part of the benefits expected from the efforts of the Expert Committee on the International Pharmacopoeia.

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## Mental Health

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Because of the tremendous shortages in trained psychiatric personnel and in facilities from a world-wide viewpoint, the first meeting of the Expert Committee on Mental Health recommended that the World Health Organization accept the preventive principle in the application of psychiatric knowledge as the most practical approach to its mental health program.

The suggested standard for adequate care is one psychiatrist per 20,000 population. The United States has more than 5,000 psychiatrists and about 700,000 psychiatric beds, but India, for example, with more

than twice the population, has at most 80 psychiatrists and 20,000 psychiatric beds. Hence, the only practical approach, the committee was convinced, was through preventive measures.

Meeting at Geneva, Switzerland, August 29 to September 2, 1949, the committee was composed of psychiatrists of six nationalities. Twenty topics were discussed and recommendations made on 19. Among the 19 were principles and priorities in mental health, health education, alcoholism and drug addiction, maternal and child health, and venereal diseases.

In each discussion the committee was confronted with the problem of inadequate numbers of trained personnel. The committee concluded that perhaps the most effective method to implement a mental health program would be through the use of public health workers.

A concrete point on which WHO could give assistance to member nations was the recommendation that it aid in the development of facilities for training public health workers in the principles of preventive mental health work, in training workers in clinical psychiatry, and in assisting pediatricians and other physicians to

obtain psychiatric and mental hygiene training.

The committee's second meeting at Geneva in September 1950 was, therefore, devoted to consideration of the application of mental health principles through public health workers, and how the job could be done.

As a result of this consideration, the mental hygiene section of WHO subsequently convened a committee

of experts on alcoholism and the original committee as such was discharged. Thus, through an ad hoc committee of specialists in a limited area, more productive results could be expected.

The significance of the expert committee plan of WHO as it applies to mental health and psychiatry was:

National and cultural experiences were brought together on a world basis. The common denominators

of these widely varying experiences were used to try to develop potential world-wide application. The recommendations of the committee, once approved by the World Health Assembly or the Executive Board, could be passed on as authoritative statements to the chief health officers of the member nations.

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## Venereal Infections and Treponematoses

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Venereal diseases have been recognized as an urgent international health problem from the earliest days of WHO. An Expert Committee on Venereal Diseases was formed by the Interim Commission and has functioned continuously since January 1948, when its first meeting was held. The committee has met twice since that first session, in Paris in 1948 and in Washington in 1949.

In outlining the principles and scope of an international program to combat venereal diseases, the committee gave first priority to the control of syphilis, followed by gonorrhea, chancroid, lymphogranuloma venereum, and granuloma inguinale. In that order. Treponemal diseases such as bejel and yaws, which constitute grave health problems in tropical and subtropical areas, have since been added to its terms of reference. Of the forms of syphilis, the early infectious stages and infantile and prenatal syphilis have received major emphasis.

Because penicillin therapy permits an approach to control of treponemal infections in terms of whole population groups, the committee has recommended WHO aid for control work in economically underdeveloped areas where prevalence of one or more of the treponemal diseases is high. It has also urged the importance of assisting countries to establish a basic venereal disease control structure headed by a health officer specializing in venereal diseases. From its first meeting, the group has pointed out the need for training in venereal disease work through demonstrations, consultative services, and fellowships, and for distribution of venereal disease literature and reference lists.

As an outgrowth of a recommendation of the committee in 1948, a Subcommittee on Serology and Laboratory Aspects was formed, and has held two meetings. Establishment of this group reflects in a concrete

way the committee's belief that effective control of syphilis depends to a large degree upon efficient serologic testing. The serology subcommittee has placed emphasis upon evaluating the efficiency of the various serologic tests, distribution of test antigens, and standardization of laboratory procedures.

The committee has expressed its belief that specialized health programs will prove most productive, on a long-term basis, if supported by a general program of disease prevention. Demonstration teams in venereal disease control and other specialties may prove valuable aids not only to combat specific health problems but also as beginning points from which over-all health programs may evolve.

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## Nutrition

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Malnutrition and even outright starvation are major causes of illness and death in many nations. Furthermore, no country, no matter how abundant its food supply, can afford to take the complacent view that abundant food automatically confers optimal nourishment.

Malnutrition is preventable. The scientific principles and practices by which nutritional health can be produced and maintained are known. However, these facts have not been

disseminated to all the peoples of the world. The application of this knowledge is further limited by traditional but improper dietary practices, by qualitative deficiencies in available food, and, unfortunately in some countries, by insufficient quantities of food.

Two international organizations, the World Health Organization and the Food and Agriculture Organization, have recognized these facts and the programs of each have the com-

mon objective of raising levels of nutrition throughout the world. Action programs must be tailored for each nation according to the nature of its nutritional problems and to the many factors which may be producing the problems.

To advise and assist in attacking this complex situation, a joint WHO/FAO Expert Committee on Nutrition was convened in 1949 and 1951. The 10 members are appointed, 5 by each organization, to

provide the highest technical competence and to obtain geographic representation.

The action programs of FAO and WHO are administered separately but coordinated closely both internationally and regionally. The joint expert committee also assists and advises in coordinating and in delineating the activities of the two organizations. In FAO programs, emphasis is on the production, distribution, and consumption of food, while in WHO it is on nutrition in relation to the maintenance of health and the prevention of disease. The FAO program, which is somewhat older than that of WHO, can point to many outstanding accomplishments. Internationally accepted data on world food consumption, calorie requirements, nutrition facts for educational purposes, and approved techniques for dietary surveys have been published and have found wide use. WHO has focused on studies

of nutritional deficiency diseases, such as kwashiorkor, endemic goiter, problems of infant feeding, and on methods for the determination of nutritional status. Internationally acceptable standardized methods for the latter purpose are being prepared by the committee. Both FAO and WHO have provided fellowships for training in nutrition and have provided expert consultants and direct technical assistance to member governments. They have conducted workshop training courses and can take much credit for instituting or improving nutrition services in many governments.

Much remains to be done. Agreement on internationally accepted dietary standards, methods of determining nutritional status which will permit comparison of one country with another, and simple methods for determining the prevalence of deficiency diseases will do much to lay a solid basis for international improvement in nutritional health.

Kwashiorkor is undoubtedly the most prevalent and serious nutritional deficiency disease in the world today. The committee has done much to gather and publicize the facts about this scourge. Rather simple methods are available for its prevention and cure, if they can be made known and applied. Beriberi continues to be a major problem in certain parts of the world. It too can be prevented and cured. Endemic goiter is still a major problem. Effective ways of iodizing locally produced salt would help combat this disease. The world population is still increasing faster than its food supply. Ways must be found to increase and extend the available food. The FAO/WHO Joint Expert Committee on Nutrition has and should continue to supply world leadership in meeting these problems.

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## School Health Services

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The Second World Health Assembly approved the inclusion of an Expert Committee on School Health in the WHO program for 1950.

The committee's task was to develop principles which would be useful in developing or extending school health services in all parts of the world where schools existed. These principles were to be as useful in underdeveloped areas as in areas more favored in their technical development. It was no small assignment.

Fortunately for the committee, there was much help available from WHO sources. Members of the Secretariat of WHO brought their experiences to bear on our problems. Especially were we indebted to the divisions of nutrition, mental health, public health nursing, maternal and child health, and health education for their contributions.

Resource persons were found, too, in the WHO's maternal and child health regional advisers who had come to Geneva from the regional offices in Washington, D. C., Alexandria, Egypt, Hong Kong, and New

Delhi, India. These people, together with observers from UNESCO, ILO, and the Social Activities Division of the United Nations, supplied the committee with first-hand data and provided "criteria of applicability" by which the committee could judge the usefulness of its product.

The report as submitted to and approved by the Executive Board of WHO gave consideration to the following:

1. The reasons for asking for special attention to children in school; children's growth and developmental needs; opportunities for health instruction.

2. The broad aspects of a school health program which emphasizes cooperative planning, the inclusion of services, programs, and an environment which promotes the health of children. Definite guides for desirable emphases to be placed by physicians, nurses, dentists, teachers, and others in their work with and for children.

Three basic principles presented in the report are: (1) a program of

health for children can be conducted when only a teacher is available; (2) professional health staff, including physicians, nurses, and dentists, contribute additional services which enrich the health experiences of the child; (3) irrespective of the number and type of personnel available, a satisfactory educational program for the child can be developed only when there is an accepted philosophy of teamwork among the staff.

Other recommendations in the report emphasized the responsibilities and interrelationships of personnel serving children, their families, and the community. Suggestions were made, too, regarding the preparation of professional personnel as well as auxiliary helpers. Final sections presented statements relating to the administration of the school health program, and suggestions for future research.

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## Prematurity

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It is generally recognized that premature birth plays a major role in causing neonatal deaths. For this reason the Expert Group on Prematurity was convened in April 1950 to prepare for the World Health Organization recommendations for reducing premature infant mortality. The experts, who came from seven countries, represented the fields of obstetrics, pediatrics, and nursing.

First consideration was given to promotion and establishment of pertinent uniform definitions to provide for comparable vital statistics. The committee recommended that the international definition of prematurity of the First World Health Assembly be adopted by all countries and that the terms "abortion" and "stillbirth" be supplanted by the term "foetal death."

In considering programs to lower the incidence of prematurity, as well as the mortality from premature birth, the expert group pointed out that the initiation of a preventive program might well precede that of a specialized-care program. Named as prerequisites were the establishment of general public health measures and the strengthening of maternal and child health programs. Recommended content of a preven-

tive program included research into causes of premature birth; an educational program to acquaint pregnant women with the importance of early and adequate prenatal care; provision for prenatal services; adequate hospital facilities for women with complications of pregnancy; the enactment of legislation to protect the working woman; and provision for services to fulfill the requirements of such legislation.

In regard to the initiation of programs for care of premature infants the expert group named certain prerequisites such as accurate birth and death statistics; evidence of a downward trend in infant mortality; qualified medical and nursing personnel; adequate hospital facilities and equipment; and social services. The organization of the program should be related to the pattern of maternity care in a given country, that is, the proportion of births in hospital and at home. Under certain conditions a program might be initiated as a local demonstration before extension of the program to wider areas.

The minimum requirements outlined for establishing a hospital unit for premature infant care included qualified and experienced medical

and nursing staffs in adequate numbers; location of the unit in an area selected to minimize cross-infections; adequate space and special facilities; medical and nursing record forms. The importance of parent-teaching and follow-up were emphasized. In some areas, home care of prematures might be satisfactory if provision were made for hospitalization of sick infants and those of low birth weight. Certain requirements for a home-care program were specified.

The essentials for development of a complete program were outlined by the experts under four main headings: administration; medical, nursing, and social services; education of professional personnel and the public; and research.

Finally, the expert group urged the awarding of fellowships for study and research in problems of prematurity and recommended to WHO the development of an information service on all aspects of the problem of prematurity.

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## Public Health Administration

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The Expert Committee on Public Health Administration was authorized by the Third World Health Assembly in May 1950. The range of this committee encompasses the entire field of public health practice. This includes not only the content of organized programs, but also the organization, administration, financing, and staffing of health services.

Perhaps the best way to describe the work of this committee is to compare it with the other expert committees drawn from larger panels set up by WHO. Most of the expert committees were set up to focus international understanding and professional guidance on specific diseases, conditions, or standards. Their concern is with methodology,

with technical knowledge, and with scientific developments. The Committee on Public Health Administration is interested in all of these developments and programs as they become part of the armamentarium of organized health services. In other words, it is concerned with the organization, the resources, the facilities through which scientific knowledge is applied in the service of people.

In a sense, the work of this committee does not lend itself to ready classification or to finite results. Criteria and methods can be developed; techniques can be standardized, and the same kinds of knowledge or principles can be applied wherever the problem exists. But

actual services may reach people in a variety of ways, through many organizations, and through widely differing patterns of administration.

Thus, one of the first jobs of this committee is to gain a better understanding of problems of mutual interest and of the factors which complicate them. It may then address itself to fostering a rational approach to health administration suited to the needs of different countries of the world. The committee will determine, for example, where and how health might be improved through organized effort, and suggest measures applicable under different situations—geographic, economic, social, and cultural. One aim is to develop not specific blue-

prints but guidelines of successful practices based on the combined thinking and experience of representatives of many different nations and methods of operation.

It was in this frame of reference that the Expert Committee on Public Health Administration held its first session in November 1951. Specifically, the committee considered the activities that might be included in organized health programs, and lessons that have been learned from different types of local health organization and practice in various countries of the world. It attempted also to list and classify health services provided by official health agencies, to enumerate the health

functions at different levels of government, to show how the peoples of the world can participate in health work, and to outline some of the problems and needs of professional and technical personnel.

Obviously it was possible to consider these and similar problems only in a tentative and introductory fashion. Careful study is still needed in many fields—in the details of organizing and financing health programs, in the organization of health services in relation to socioeconomic and national background, in specific patterns to meet specific needs, to name only a few. Of particular importance is more thorough exploration of the problems in public health administration

encountered in the underdeveloped countries of the world.

The membership of this committee brings together a wide variety of experience in health administration. By acting as a resource and reference body for assembling and evaluating information and experience, by stimulating further study and exchange of knowledge, and by formulating general principles of desirable health administration and organization, it can play an important role in bringing us closer to world-wide health goals.

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Chairman of the Department, and  
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## Tuberculosis

The WHO Expert Committee on Tuberculosis has held five sessions since it was created in April 1947 at the third session of the Interim Commission.

At the first meeting in 1947, the committee discussed its fields of activity, techniques for the international control of tuberculosis, and emergency measures.

Because tuberculosis is epidemic in many countries, initial action was taken in applying emergency measures. The committee recommended that demonstration teams be formed to conduct intensive programs of BCG vaccination in war-devastated countries. Although the committee realized that this measure alone would not be sufficient to control tuberculosis in these countries, it hoped that this type of operation and its successful demonstration would encourage local groups to develop and conduct more comprehensive programs.

The BCG vaccination program has made vigorous progress with the

generous and energetic cooperation of the Scandinavian Red Cross Societies and UNICEF. Studies are also being made to determine the duration of immunity conferred by this vaccine and to establish more definitively its effectiveness as a preventive.

The more general fields of activity in international tuberculosis control were designated as prevention, case finding, isolation and medical care, rehabilitation and aftercare, and social and economic protection of afflicted families.

Among the techniques of control outlined by the committee were (1) determination of the extent of the problem; (2) recruitment and training of professional personnel; (3) provision for physical facilities, supplies, and equipment; (4) public health education; (5) field services in administration, epidemiology, laboratory, and clinical work; (6) the provision for adequate funds; and (7) the development and establishment of uniform procedures in:

tuberculin and tuberculin testing, preparation and clinical use of BCG, classification of tuberculosis, X-ray interpretation and mass radiography, laboratory diagnosis of tubercle bacilli, and evaluation of new chemotherapeutic agents.

It also suggested the establishment of cooperative working relationships with all official and voluntary groups actively engaged in some aspect of tuberculosis control; eradication of tuberculosis in cattle; counsel to national governments and health departments on sound laws and regulations pertaining to human and bovine tuberculosis; and review and evaluation of the program at regular intervals.

During 1950, the expert committee was enlarged and reconstituted as a panel of experts in tuberculosis, to be consulted from time to time as new problems arise.

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*For purposes of brevity, names of committee members and other facts have been omitted from these statements. Full reports of the committees, however, are published in the World Health Organization's "Technical Reports Series." These and other publications of WHO are available through the Columbia University Press, International Documents Service, 2960 Broadway, New York, 27, N. Y. Orders may also be addressed to: World Health Organization, Sales Section, Palais des Nations, Geneva, Switzerland.*

# WHO and Environmental Health

By HERBERT BOSCH, M.P.H.

"More than three-fourths of the world's population drink unsafe water, dispose of their human wastes recklessly, prepare their milk and food dangerously, and are plagued by insects and rodents." An even more startling statement on the magnitude of the problem of faulty environment is that of the Director-General of the World Health Organization, "one-fifth of all the deaths in the world are due to faulty environment" (1). Yet quoting Dr. H. Van Zile Hyde, "The major health problem of the world today is not death—it is chronic and repeated infections and infestations which convert man from a productive unit of society to a liability to society" (2). It is small wonder, then, that the World Health Organization is devoting more and more attention to problems of environmental health. The WHO proposed program and budget estimates for the year 1952 state:

The ravages of water-borne, insect-carried and excreta-transmitted diseases outweigh in economic and public health importance those of almost any other group of diseases. Their control is based on universally accepted principles of sanitation and hygiene. Their origins are nondebatable; their epidemiology has long been known; the costs of correction, although significant, are often not insuperable if ingenuity and imagination are applied. With the limited funds at

its disposal WHO will continue to assist member states in improving environmental sanitation, for it is evident that this is work which will yield very large returns.

Many observers at the Fourth World Health Assembly, which met in Geneva in May 1951, commented on the increasing interest in environmental sanitation shown by the delegations from nearly all member states. Illustrative of this spirit was the resolution introduced by the Indian delegation and unanimously adopted by the Assembly. It urged member states to employ more sanitation personnel and recommended that WHO help in the creation of training facilities for such personnel. Col. M. Jafar, the principal delegate for Pakistan, and chairman of the program committee of the Fourth World Health Assembly, said that the committee was of the opinion that the best way of proving the importance of preventive medicine was to choose projects which give demonstrable results and that environmental sanitation projects were particularly suitable from this standpoint. It is also significant that the theme of the 1952 World Health Day was "Healthful surroundings make healthy people."

## Organization of Sanitation Services

In the Secretariat of the World Health Organization the division of environmental sanitation on January 1, 1952, was charged with responsibility in the following fields:

1. Municipal sanitation, including water supplies, sewage and waste treatment, garbage and waste disposal.
2. Rural sanitation, including water supplies, sewage and excreta disposal, sanitation of isolated dwellings.
3. Housing and town planning.

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4. Insect, rodent, and other vector control (acting as a service unit to the medical divisions and sections having responsibilities in this field).

5. Milk and food sanitation.

6. Environmental phases of occupational health.

7. Advice to the division of education and training on matters pertaining to environmental sanitation personnel.

The director of this division participates with the directors of the other eight technical and three administrative divisions in the Secretariat on over-all planning and coordination. Not all of the environmental health activities of WHO are conducted by this division. For instance, the work in malaria control, which has been an outstanding example of effective preventive medicine, is a responsibility of the malaria section, a component of the division of communicable diseases. There is, however, in the WHO Secretariat a general desire to eliminate water-tight compartments, and there has been close cooperation between the personnel assigned to the malaria section and those in the environmental sanitation unit.

Operational responsibility for environmental sanitation activities is vested in six regional offices serving: Africa, the Americas (the Pan American Sanitary Bureau serves as the regional office for the Americas), Southeast Asia, Europe, Eastern Mediterranean, and the Western Pacific.

The staff of each of these regional offices includes an adviser on environmental sanitation who is a sanitary engineer with public health experience and training. Usually, there is also a regional adviser on malaria. WHO demonstration teams, consultants, and personnel conducting other activities in individual member states are under the supervision of the appropriate regional office. WHO does not have legal authority over any member states—it operates only at the request of the nation affected. In appropriate fields work is done cooperatively with the other specialized agencies of the United Nations such as the Food and Agriculture Organization, the United Nations Educational, Scientific, and Cultural Organization, the International Labor Organization, and the United Nations International Children's Emergency Fund. Every attempt is also made to utilize the resources of the United Nation's



Water treatment plant at AKABA Refugee Camp near Jericho (Hashemite Kingdom of Jordan). Operator is an Arab refugee. The T 3 GD8 on the building indicates that it has received a DDT, ganexane residual spray.

program for technical assistance for economic development of underdeveloped countries.

### Methods of Operation

The very small budget, considering the number of activities attempted, allows WHO to assign only a limited number of personnel to environmental sanitation work. On December 1, 1951, less than 75 persons, including physicians, entomologists, public health engineers, and sanitarians, were assigned to such activities. Ten of these were on teams assigned to relief operations among the civilians of Korea. It is therefore apparent that WHO cannot make a significant impression on sanitation problems by attempting to intensify and augment the work of existing national agencies. To have an appreciable effect, WHO has directed its efforts principally toward such activities as:

1. Collection and exchange of scientific and technical knowledge by expert committees, expert panels, and scientific conferences.

2. Training of national personnel by assignment of demonstration teams.

3. Training either by traveling fellowships or by enrollment in formal academic courses.

4. Strengthening of training facilities.

5. Short-term expert consultation on specific problems.

The results obtained by these methods when compared with the expenditures have been ex-

ceedingly good. Most of the work has been sound and will have long-time effects.

### **Expert Panels and Committees**

Expert panels and expert committees on various specific subjects are widely used by WHO. Members of the various expert panels are selected by the Director-General because of their knowledge in specific fields and with regard to geographic distribution. Before making an appointment to a panel, the Director-General obtains the concurrence of the government of the country of which the expert is a citizen. However, that government does not nominate candidates for the panel. Hence, expert panel members do not officially represent their countries. The members of these panels are expected to keep the Secretariat of WHO advised of current developments in their specific fields and areas. They also receive information furnished by other members of the panel.

From the expert panels, the Director-General from time to time constitutes expert committees which are convened to advise WHO on the technical aspects of its activities. The reports of the committees are published in a WHO Technical Report Series and are available at very low costs from agents in most countries. To persons interested in environmental sanitation, the reports of the Expert Committees on Environmental Sanitation, Malaria, Insecticides, and Cholera are particularly valuable. These reports represent the consensus of well-recognized experts. The reports of the committees are transmitted by WHO to all of its member states. The Executive Board of WHO may comment on the reports but it does not amend them.

### **Conferences and Seminars**

Another device for exchanging scientific information has been the use of conferences and seminars. In Europe two conferences on sanitary engineering have been held. The first in 1950 at The Hague was conducted under the auspices of the Government of the Netherlands, WHO, and the Rockefeller Foundation. Representatives from 14 European nations were present. The primary objectives of the con-

ference were: (a) to disseminate knowledge of the status and needs of sanitary engineering in the various countries; (b) to stimulate and coordinate European research in environmental sanitation; (c) to bring about closer relationships between sanitary engineers in the countries of Europe.

The conference was highly successful from the standpoints of exchange of information and of focusing attention on the need for coordination of research. There is no doubt that the third objective was also accomplished. The Rockefeller Foundation, the Government of Italy, and WHO conducted a similar conference in Rome in November 1951. In addition to engineers, a number of physicians from national health departments attended. From the conference the public health administrators learned more about the contributions the engineer can make to the public health team.

Another outstanding conference sponsored by WHO (in conjunction with the Commission for Technical Cooperation in Africa South of the Sahara) was the Malaria Conference held in Kampala, Uganda, in November and December 1950. This conference, participated in by well-known experts, considered all available information and made specific recommendations for malaria control work.

### **Demonstration Teams**

Teams of specialists sent to individual countries have been used by WHO to train personnel in that country in new techniques. In the environmental sanitation field most of these specialist teams have been concerned with malaria control. Teams for mosquito and other insect control have functioned in four different areas in India, and in Pakistan, Thailand, Afghanistan, and Cambodia. Iran and six countries of Central America have also been assisted in insect control work. Frequently such teams must first obtain information on the mosquito vectors in the area and then must develop economical methods of control. The work done by these malaria control teams has been highly beneficial. There is no doubt that they are truly demonstration teams. Dr. Leonard A. Scheele, president of the Fourth World Health Assembly, in his presidential address, made the

statement that the WHO malaria control teams had protected directly only 1½ millions of people but that the demonstrations of these teams had resulted in programs which are protecting 50 million people. These malaria control teams have included in their personnel either public health engineers or sanitarians. These sanitation personnel have done much general sanitation work in addition to malaria control. Several countries, including Pakistan and Afghanistan, strongly requested the continuation of general sanitation activities after the malaria control teams finished their assignments.

A contemplated type of WHO specialist team activity is the use of cholera control teams, each of which will have a public health engineer as an important member. The WHO Expert Committee on Cholera, meeting in New Delhi in November 1951, recommended that sanitation measures be one of the principal methods of attacking cholera. The arguments for this were skillfully put forth in a paper prepared by K. Subrahmanyam (3), professor of sanitary engineering at the All-India Institute of Hygiene and Public Health. One pertinent portion of his paper follows:

The fact that we know about cholera is that it can be transmitted from person to person through drinking water or food contaminated with the organisms. This is sufficient to justify a demand for uncontaminated water and food, and an environment in which there will be few flies and no excreta exposed or accessible to flies. The demand is for environmental sanitation, and when that is granted it should reduce the chances of spread of the disease, reasoning on the facts we know. Environmental sanitation appears to be a necessary condition for eradication of cholera.

A type of demonstration team which is coming more and more into use in WHO is the general public health team. These teams always include a public health engineer or a sanitarian. This fits into the concept that to develop public health protection in most countries there is a need for a program that includes all the basic services, of which one certainly is environmental sanitation.

#### Training Personnel

Specialists and experts from other countries can be, and are, a great help to an underdeveloped country in starting a program. However,



Arab refugee in the Hashemite Kingdom of Jordan performing orthotoluidine test for residual chlorine. He was trained by a WHO engineer.

to make a sound environmental sanitation program stick, the leaders of the program must be nationals of the country and must have the specialized training necessary to carry on the program. The sanitation personnel in these countries must be at several levels of competence. The second meeting of the WHO Expert Committee on Environmental Sanitation devoted its entire time to the questions of the education, training, and utilization of sanitation personnel. The following statement in the committee's report is relevant to the use of high-level personnel in underdeveloped countries:

The assumption, perhaps too widely made, that underdeveloped regions are not prepared for the services of the best trained specialists in environmental sanitation can readily be contested. Countries of minimum resources are most in need of the highest expert service available, both for diagnosis of need and for programing of solutions. The relegation of these functions to less adequately prepared persons results from a great misunderstanding of the complexity of the problems in environmental sanitation normally encountered in areas of low economic level. These



problems require for their solution the impact of high intelligence, training, and experience, even when the number of persons possessing such qualifications is necessarily a minimum. It is unsound practice literally to send a boy to do a man's job.

### **WHO Fellowships**

To assist in training top sanitation personnel both in governmental work and in teaching positions, WHO grants fellowships which finance the cost of the training of individuals selected by their government in consultations with WHO officials. Some training fellowships are used at established educational institutions. In other cases the grant is for a traveling fellowship which the fellow uses to visit and to make observations on installations, governmental units, institutions, and other places or programs of particular interest to him. Ordinarily these traveling fellowships are reserved for persons who have had sufficient experience to allow them to evaluate their observations and to adapt them to their own conditions. A number of United States citizens have received such fellowships—a typical one was granted the sanitary engineer of the Alaska Health Department to allow him to study cold weather sanitation practices in the northern Scandinavian countries. Another grant allowed the chief sanitary engineer of the Ministry of Health of Israel to observe sanitation practices in the Americas.

Fellowships for formal study at educational institutions are widely used. The purpose of the fellowships, of course, is to train key people who will be able to develop and improve programs in their own countries. For instance, a fellowship was granted in 1950 to an engineer from the Hashemite Kingdom of Jordan for studying sanitary and public health engineering at the Imperial College of Science and Technology (London) and the London School of Hygiene and Tropical Medicine. This engineer is now in the governmental service in his country and is the first sanitary engineer to be so employed. Only in exceptional cases are fellowships for formal education granted to undergraduates—WHO feels that the candidate should have had his basic training before he receives financial assistance. One exception to this rule was the granting of a fellowship to an undergraduate engineer from Liberia. In that

country only one national has an engineering degree, and there is no university or school offering engineering education. It was the belief of WHO officials that one of the basic needs was for a sanitary engineer in the Health and Sanitation Department of the Republic and that the fastest method of fulfilling this need was to assist in the training of a suitable candidate at the undergraduate level.

In many of the underdeveloped countries, there is a great need for the training of intermediate and low-level sanitation personnel. Obviously, such training must be given locally. Within the limitations of its budget, WHO attempts to assist in such training. In the African region a sanitarian, experienced in tropical sanitation, devotes much of his time to this type of activity. In Afghanistan, the WHO sanitary engineer spends a large portion of his time in such training work.

### **Strengthening of Training Facilities**

The prevailing feeling in WHO is that, in general, sanitary engineers and other sanitation personnel profit more if their first formal specialized training is received in a locality where the climatic, economic, and cultural patterns are similar to those in their own country. If this is to be done, strengthening of training facilities in the underdeveloped countries is essential. Unfortunately, WHO's budgetary provisions for such action are limited. However, some assistance has been given toward the strengthening of sanitary engineering work at the All-India Institute of Hygiene and Public Health by a grant for the purchase of equipment, and a current project provides for a professor of sanitary engineering for Thailand.

### **Short-Time Consultants**

WHO furnishes a considerable amount of assistance to its member states by the use of short-time consultants. Such consultantships in specific problems frequently make it possible to obtain experts who would not be available for long-time employment. These services are requested at times by the highly developed countries as well as by countries which have not progressed so far economically. For instance,

consultants have not only gone from the United States, but the program also operated in reverse when an expert on garbage and refuse disposal from the United Kingdom gave assistance to Federal, State, and local health authorities in the United States.

### Services for Special Groups

Earlier in this discussion it was implied that WHO does not conduct routine operational programs. There is an exception to this rule since the constitution of WHO states that WHO shall "provide or assist in providing, upon the request of the United Nations, health services and facilities to special groups." Two large special groups, the civilian population of Korea and the Arab Palestine refugees, have been furnished health services.

In Korea, WHO was asked in 1950 to furnish personnel, including 10 sanitation specialists, to serve under the unified command. Five sanitarians and 5 sanitary engineers were recruited to bring emergency health services to the hordes of civilians whose lives were disrupted by the war. Their work was concentrated on matters of basic sanitation and insect control. On January 1, 1952, all health and sanitation work of the United Nations was taken over by the United Nations Korean Reconstruction Agency and these personnel were given the option of transferring to the new agency.

In the Near East, WHO had also assisted in carrying on a health program among the Arab Palestine refugees. These refugees now live in areas of Lebanon, Syria, Hashemite Kingdom of Jordan, and the Gaza area. The over-all United Nations responsibility is vested in the United Nations Relief and Works Agency for Palestine Refugees in the Near East.

The health and sanitation staffs were partially recruited by WHO, and the work is headed by a public health physician employed by WHO. Two of his principal staff members are also WHO employees—a physician-malariologist and a sanitary engineer. The environmental sanitation work among these refugees has been of prime importance since more than half of the 800,000 refugees are living in crude hut and tent camps in a highly malarious region. In many cases there was a problem not only of providing satisfactory sanitary facilities but also of educating the inhabitants of the camps in proper methods of use. A problem of great magnitude is that of fly control since flies in that area are not only implicated in the transmission of gastrointestinal diseases but are also the cause of many of the ophthalmic conditions observed in children. The fly problem certainly has not been solved, but it has been reduced.

### Conclusion

Because of limitation of funds WHO has made only a meager beginning on many of the sanitation problems of the world. However, its environmental control work has been sound. With a more adequate budget WHO could accelerate the progress which its individual member states are making in producing a satisfactory physical environment.

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# Bacterial Genetics and Drug Resistance

By BERNARD D. DAVIS, M.D.

The emergence of drug-resistant organisms in patients receiving chemotherapy has presented a serious medical and epidemiological problem. To a certain extent this problem is abating; for although most organisms readily develop significant degrees of resistance to sulfonamides or streptomycin, there has been little clinical appearance of resistance to penicillin, except among staphylococci, or to the newer antibiotics (chloramphenicol, aureomycin, and terramycin). In the treatment of tuberculosis with streptomycin, however, drug resistance remains a major limitation.

This problem in tuberculosis has been discussed in detail by Yegian and Vanderlinde (1). The present paper will particularly consider drug resistance in the light of developments in bacterial genetics.

## Bacterial Variations

In this recently expanding discipline, bacterial variations, long studied by bacteriologists in an empirical manner, have been re-examined from the point of view of modern genetics (2). With few exceptions, these variations have been found to fall into two classes: physiological and genetic. Physiological adaptations to a changed environment involve all the cells in a culture, and are noninheritable, being reversed by return to the original environment; genetic changes, in contrast, involve only a tiny fraction of the cells in the original population, and

are inheritable, being transmitted from generation to generation of the offspring of the changed cells, even when grown in the original environment. Drug resistance belongs to the inheritable class, which also includes inheritable changes in a variety of other characteristics, such as morphology, nutritional requirements, and virulence.

Inheritable bacterial variations resemble the mutations of higher organisms, as Beijerinck pointed out within a few months after the discovery of the latter by De Vries in 1900. Only within the past decade, however, has it become generally recognized that the two processes are alike in several respects: not only are their effects inheritable, but both changes occur spontaneously in an exceedingly small fraction of a population of cells, and both are increased in frequency by certain physical agents (ultraviolet, X, or radioactive irradiation) or certain chemicals (e. g., nitrogen mustards). The resemblance is further emphasized by recent evidence that bacteria have much the same genetic apparatus as do cells of higher forms: nuclei have been demonstrated in bacteria (3), and within these nuclei there are chromosomes which appear to undergo mitosis (4). Furthermore, some bacterial strains can inherit features (including acquired drug resistance) from two different parents, as in the sexual process of higher organisms (5). Let us, therefore, briefly consider the nature of genetic mutations. A stimulating exposition of genetic principles can be found in Schrödinger (6).

## Mutations

By many lines of evidence it has been shown that almost all the inherited properties of ani-

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imals or plants are transmitted by their genes—self-duplicating material units or regions located in chromosomes in the nuclei. The inborn nature of an organism is determined by the combination of genes it receives from its parents. Usually each individual gene is transmitted unchanged from generation to generation, but rarely—with most genes, once in a million to a billion cell generations—a gene will spontaneously undergo an inheritable change. These changes are called mutations; a cell or organism bearing a mutated gene is called a mutant. Mutations occur at random; it is impossible to predict which individual in a population, or which gene in an individual, will undergo mutation in a given generation.

These spontaneous mutations, along with Darwinian natural selection, are considered by modern geneticists to be the mechanism of evolution in the biological kingdom. Mutations of all sorts are constantly occurring in all species; each environment selects for survival those mutants that are especially fitted for that environment. Even in the nineteenth century, before the discovery of mutations, biologists had largely abandoned the alternative Lamarckian view that organisms can inherit characteristics acquired by a specific useful or purposive adaptation to the environment. All experimental attempts to demonstrate such a process failed.

It should be emphasized, however, that the nineteenth-century experiments that defeated Lamarckism involved only characteristics (e. g., mutilations) acquired by somatic cells. And, indeed, one could not conceive, in terms of modern biology, that a giraffe's neck stretched or a puppy's tail hacked by an experimenter could lead to a longer neck or a shorter tail in the next generation. The hereditary nature of this generation would be determined by the parents' germ cells—the spermatozoa and ova—and these have no evident means of reflecting a mechanical change in the somatic cells.

But is it safe to exclude the Lamarckian theory for one-celled species as well as for higher organisms? In bacteria there is no distinction between germ cell and somatic cell; there are only genetic (heredity-determining) and nongenetic parts of a single cell. It is therefore conceivable that a drug, having penetrated into a bacterial cell, might somehow

direct changes in the genetic part of the cell that would result in a mutation to drug resistance. To be sure, the fact that resistance arises only in a tiny fraction of the population might seem to suggest a spontaneous origin of the mutation, but it hardly proves such an origin—for the very test for the presence of these resistant cells in the population always requires exposure of the population to the drug, and it might be *during* that exposure that the mutation first occurs. Neither the nineteenth-century polemics on evolution nor careful scrutiny of the ordinary drug experiments can settle the issue; a subtler approach is needed.

### Evidence for Spontaneous Mutations

The question was answered definitely by a statistical approach (fluctuation analysis) designed by Luria and Delbrück (7) to study the similar problem presented by bacteriophage resistance and subsequently applied by Demerec (8) to drug resistance. The argument runs as follows: Let a few colon bacilli, including no drug-resistant mutants, be inoculated into a flask containing 100 ml. of medium, and at the same time inoculate a few bacilli into 100 tubes each containing 1 ml. of medium. After incubation, the total number of bacteria in the 100 small vessels is the same as the number in the large one. And if the contents of the 100 small vessels are mixed, and samples from this mixture and from the original flask are tested by plating in the presence of the drug, the number of resistant mutants is also found to be about the same in the two lots of bacteria.

But if the 100 tubes, instead of being mixed, are separately tested, what will the distribution be? There are two possibilities. If the mutations do not occur until exposure to the drug, these separately grown samples should be indistinguishable from 100 samples from the single flask and should show the same distribution as is found with the latter, namely, a constant number of mutants in each sample, except for the inevitable statistical variation in sampling. But if the mutations have occurred before the test with the drug, the numbers of mutants in the 100 tubes should fluctuate more widely, for the following reasons. Since mutations are chance events, some tubes will develop a first

mutant earlier than others. And since mutants breed true, each mutated cell will give rise to a family of mutants that doubles with each generation as long as the population continues to grow. Hence, the tubes with an early mutation will have a large number of mutants when full growth is reached while, at the other extreme, some tubes will have few or no mutants. The question, then, is simple: Will the fluctuation in the number of mutants be the same in the separate tubes as in the samples from the single flask?

When the experiment was performed, the fluctuation was found to be much greater with the 100 separately grown tubes than with 100 samples from a single culture; indeed, a few "jackpot" tubes yielded hundreds of mutants while others yielded none. In these jackpot tubes the first mutation must have occurred many generations before the culture stopped growing. The issue, then, has been critically settled in favor of the classical genetic view: Mutations to drug resistance have occurred before exposure to the drug, and the drug then acts as a selective agent.

Fluctuation analysis shows how an ingeniously designed experiment can furnish a decisive conclusion that replaces earlier opinions formed on the basis of intuitions and analogies—often the only available basis for answering complex medical and biological questions, but hardly a satisfying one. Even more direct evidence for spontaneous origin of drug-resistant mutants has since been obtained by other workers (Newcombe, Lederberg) who spread bacteria densely on a plate of medium without a drug and showed that after some growth resistant cells, detected by subsequent transfer, were present in clusters.

Some investigators still believe that drugs play a directive role, but their evidence does not include the critical test of fluctuation analysis. The present state of the problem can be summed up by saying that spontaneous mutation plus selection has been demonstrated in some cases of drug resistance; drug-directed mutation has been demonstrated in no case; but drug-directed mutations are still theoretically possible.

There is little doubt that spontaneous mutation to drug resistance occurs in the patient at

much the same rate as that at which it occurs in the test tube. In either circumstance, however, the speed of emergence of a predominantly drug-resistant population depends not only on the rate of mutation but also on the efficiency of selection. In the homogenous environment of the test tube, the possibility of sharp selection, with survival or proliferation only of mutants resistant to a given concentration of drug, allows precise quantitative experiments. In the experimental animal or patient, however, selection will be affected by a variety of other factors. These include variations, with respect to time and to region of the body, in drug concentration, bacterial population density, rate of multiplication, rate of bactericidal action, and in the elimination of mutants and nonmutants by host defenses. It is easy to see how these complicated interactions of drug, parasite, and host can reduce the predictability of the results. But there is little likelihood that the host can alter the primary process of spontaneous mutation.

#### **Persistence of Resistant Strains**

What happens to drug-resistant strains after the drug is eliminated from their host, or when they are cultivated in drug-free media? It is known that most mutants revert at a low rate, by a second mutation, to strains that behave like the original parent. But these reverted strains will not replace the predominant strain unless they have some selective advantage over the latter. Some resistant mutants do grow more slowly than their parents or their reversions, and hence tend gradually to be outgrown by sensitive reversions when cultivated in the absence of the drug. But other resistant mutants are just as fast-growing, and just as virulent, as their reversions, and hence tend to persist in the population.

This persistence in the population has important epidemiological consequences. The widespread use of a drug among the hosts will alter the ecology of a parasite, and hence may lead by a selective process to widespread distribution of strains resistant to that drug. A striking example is presented by gonorrhea, a disease that offers an especially favorable opportunity for such selection since its transmis-

sion is restricted to human beings. In New York City, for example, the proportion of cures achieved with sulfonamides dropped from about 90 percent in 1936 to about 30 percent in 1942. Had other drugs (e. g., penicillin) not become available, the chemotherapy of gonorrhea would have stopped. At present, a similar spread of penicillin-resistant staphylococci and, to a much smaller extent, of streptomycin-resistant tubercle bacilli, appears to be taking place.

### Approach to Drug Resistance

How can a knowledge of the genetics of drug resistance help the physician and the public health worker? For one thing, it tells us that, though mutation rates can be increased by a variety of physical and chemical methods, no method for decreasing these rates is known or seems likely to appear. The best prophylactic approach to drug resistance, therefore, appears at present to consist of attempting to suppress the selection of mutants, since there is no way of suppressing their formation. And in this search for a method of suppressing selection by a drug, genetics offers positive help. It provides a clear rationale for a method that was originally suggested, on intuitive grounds, by the founder of chemotherapy as early as 1912 (9): combined therapy with two independently acting agents. If one cell in  $10^6$  mutates to resistance to one drug, and one in  $10^6$  to another drug, only one in  $10^{12}$  will simultaneously develop both mutations. Hence, doubly resistant mutants have a negligible probability of emerging from a sensitive strain in the presence of effective concentrations of two chemotherapeutics with different modes of action, even though such double mutants can easily be obtained by selection, first with one drug and then with the other.

The principle of combined therapy has recently been applied clinically, with encouraging results, in treating tuberculosis with streptomycin plus either *p*-aminosalicylic acid or a thiosemicarbazone. It seems safe to predict that even more satisfactory results will appear as optimal dosage schedules are worked out and better drugs are provided.

Furthermore, the recent applications of genetic principles described here, together with other valuable applications of genetics to the study of intermediary metabolism and drug action, suggest that this field might well be given more emphasis in the future training of physicians and public health workers.

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# Back-Pressure Arm-Lift Artificial Respiration

By HEINZ SPECHT, Ph.D.

*On December 6, 1951, the Department of Defense announced the adoption of an improved method of manual artificial respiration. The new method, a back-pressure arm-lift method originally described by Holger-Neilsen, has been adopted by other organizations, including the American National Red Cross; the American Telephone and Telegraph Co.; United States Bureau of Mines; Boy Scouts of America; Camp Fire Girls, Inc.; Council on Physical Medicine and Rehabilitation, American Medical Association; Federal Civil Defense Administration; Girl Scouts of the U. S. A., Inc.; and Public Health Service, FSA.*

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Opinions regarding the "best" method of manual resuscitation have never been unanimous. Until 1927, when the Public Health Service Conference on Artificial Respiration was held, a variety of methods were used. As a result of that meeting, a number of groups (1) representing the major interests in this country agreed that the prone-pressure method be adopted as the standard to be taught throughout the country.

Sporadic interest in the basic principles of resuscitation continued in the laboratories, but their findings rarely reached the groups teaching resuscitation methods. The general feeling that manual resuscitation was only par-

tially successful stimulated efforts to develop mechanical aids. Some authorities still consider that the manual method is only a temporary measure to be used until mechanical means can be applied, whereas it is evident from the recent research that proper manual methods are fully adequate.

Analyses of the effectiveness of manual methods on the basis of field experience have not been reliable, for obvious reasons, and the most optimistic reports indicate that not more than 75 percent of the efforts at manual resuscitation were successful. It is apparent that an accurate estimate of the ratio of successful to unsuccessful resuscitation attempts cannot be made. Unsuccessful cases are not likely to be reported, and reports of successful attempts include persons who would have revived without application of artificial respiration.

It was the realization of this general feeling, at least among the medically and scientifically trained portion of the population, that led the Red Cross in 1946 to support specific investigations on the effectiveness of various methods of manual artificial respiration. In 1948, a conference on this subject, called by the American National Red Cross with a subcommittee of the Committee on Physical Medicine of the American Medical Association, increased the impetus to apply modern methods of quantitative research to the problem. In 1949, the medical laboratories of the Army Chemical Center took up the question in connection with chemical warfare.

The import of these discussions, especially as they bore on civil defense activities, brought the whole matter to a critical point. Rapid progress was made when, in 1950-51, the several military departments supported four decisive

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## Back-Pressure Arm-Lift Artificial Respiration

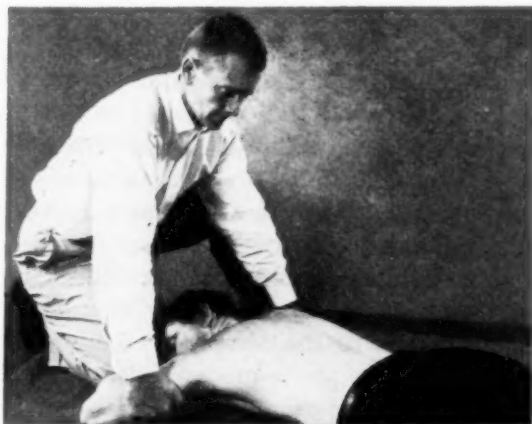
Correct positions for the back-pressure arm-lift method of artificial respiration are illustrated below. In this method the person is placed prone with the elbows bent and with one hand upon the other. The forehead is placed on the hand with the face turned slightly to one side. The operator kneels on one knee at the head of the victim.



**1** To start the cycle the operator places his hands on the victim's back so that the thumbs just touch and the heels of the hands are just below a line between the armpits.



**2** He then rocks forward slowly, keeping the elbows straight, until his arms are approximately vertical, exerting steady pressure upon the back.



**3** Then he rocks backward, slowly sliding his hands to the victim's arms just above the elbows.



**4** Continuing to rock backward he raises the arms to lift the chest weight from the floor and expand the chest.

investigations in response to the need for conclusive data to support the most effective method for inclusion in the pending revisions of the military first-aid manuals. On October 1-2, 1951, the National Research Council's ad hoc committee on artificial respiration recommended that the Holger-Neilsen method be adopted as the standard method of manual artificial respiration. This recommendation was based on a series of investigations (2-7) which should be understood by all public health workers. Although many national organizations teach resuscitation, and it is the direct function of the American National Red Cross to teach the newly selected standard method for the civil defense program, the dissemination of the reasons for the change from the Schafer prone-pressure method should be undertaken by every person in a position to use, teach, or recommend resuscitation procedures.

The several investigations (2-7) form the most significant assay of manual artificial respiration that has been attempted.

#### **Resuscitation Methods**

Actually, many variations of several basic methods were applied, but in general it was found useful to categorize the methods functionally as to what is done to the subject and to observe the most effective technique for each of a selected group. These are briefly defined as follows:

*Prone Pressure* (Schafer). Subject on belly, head on hands, mouth to side, bimanual pressure applied to lumbar back.

*Supine Chest-Pressure Arm-Lift* (Silvester). Subject on back, mouth up or to side, operator folds forearms over chest applying pressure, unfolds arms and extends them over subject's head, either partly or completely horizontal.

*Prone Back-Pressure Arm-Lift* (Holger-Nielsen). Subject on belly, head on hands, mouth to side, operator applies bimanual pressure below shoulder blades, then lifts arms at elbows to expand rib cage and partially lift chest.

*Prone Hip-Lift* (Thompson, Emerson-Ivy). Subject on belly, head on hands, mouth to

side, operator raises hips 4 to 6 inches. (May be combined with back pressure.)

*Prone Hip-Roll* (Emerson-Ivy). Subject on belly, head on hands, mouth to side, operator raises one hip 4 to 6 inches. (May be combined with back pressure.)

The principal difference between the prone-pressure method and the others listed is that the latter include an active inspiratory maneuver either by manipulation of the arms or by raising the hips. This action affords not only greater tidal exchange but also, perhaps, a larger surface for gaseous exchange.

One of the more important advances in methods of study of manual artificial respiration lies in the use of curarized and anesthetized volunteers (2) whose flaccid condition simulates the deep asphyxial condition of the more serious apneic cases. In addition to this, large numbers of acapnic apneic volunteers, some traumatic apneics, and large numbers of fresh cadavers were also subjected to the various artificial respiration methods. The various approaches gave essentially similar results (2-7) which will be briefly paraphrased here.

#### **Results of Studies**

The studies on air-flow patterns and pulmonary ventilation (2) show that the two-phase methods as a group are about twice as effective as the prone-pressure method. Pneumotachographic analysis shows that a rate of 10-12 complete cycles per minute in these cases permits completion of each cycle.

Pulmonary ventilation studies on nonapneic subjects (3) gave results similar to those on apneic subjects, indicating an equivalence of the various two-phase methods and a twofold superiority over the prone-pressure method.

Studies on the mechanics of breathing during artificial respiration by the various methods (6) showed that the two-phase techniques were superior to the prone-pressure method in clinical traumatic apneics and that air-flow measurements indicated a better utilization of the respiratory cycle for ventilation in the two-phase techniques than in the prone-pressure method. A similar experience regarding the efficacy of the various methods (7) was reported from another group of clinical apneics in which



higher rates of respiration were found to be more effective.

Circulatory studies (2) showed that the prone-pressure method could not maintain adequate blood oxygen levels in three of nine cases and that it gave the lowest blood oxygen levels of any method used. All the two-phase methods gave adequate blood oxygen values, although none produced normal saturations. Hyperventilation was not found to be deleterious in these subjects.

The energy expended by the operator in carrying out the various maneuvers was assessed in terms of oxygen consumed per unit time (2,4). It was apparent that the prone-pressure maneuver was least taxing, the hip-lift method most taxing, and the others intermediate.

The "teachability" of the previously non-standard methods (5) was assessed on a large group of operators (667 male and 214 female). Both objective and subjective reports indicated that a 10-minute instruction period was sufficient to adequately teach the various back-pressure hip-lift maneuvers. The back-pressure arm-lift method was found to be more readily learned than the hip-lift maneuvers. The principal difficulty leading to variation in learning and execution lies in the difference in size between the operator and the subject.

Together with the background of earlier work these data indicate that the prone-pressure method (a) produces the least pulmonary air exchange of the major methods that have been proposed; (b) that in some individuals the air exchange is no greater than the volume of air in the respiratory passages; and (c) that it is less effective in flaccid individuals, that is, as occurs in deep asphyxia.

Although nearly all methods in the hands of unskilled or unthinking operators may produce trauma, especially where damage exists, there are no such reports from countries where the back-pressure arm-lift method is practiced

generally. On the other hand, the prone-pressure method has been reported to have caused occasional trauma principally in the hands of large operators on slight or immature victims. Obviously, discretion must be used when traumatic accident cases are handled. For this reason alternative methods should be available. From the several two-phase methods, such a choice can readily be made without serious loss of ventilating efficiency.

It is apparent that the back-pressure arm-lift (Holger-Nielsen) maneuver is the choice for a standard manual artificial respiration method, on the basis of efficiency, ease of teaching, and feasibility.

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# Effect of Incomplete Information on Estimating Prevalence of Disease

By ALBERT P. ISKRANT, M.A., and QUENTIN R. REMEIN, B.A.

One of the most difficult problems for the statistician who is attempting to measure the incidence or prevalence of abnormal physical conditions in groups or samples of persons is the effect on his estimates of the "not observed"—the nonrespondents in the sample group to be studied.

This problem occurs in many fields of investigation. The statistician may wish to estimate the prevalence of syphilis in males of certain age groups, on the basis of the results of blood tests made as part of their selective service examinations. How about persons deferred for nonmedical reasons, volunteers, or those rejected for physical reasons before being blood tested? Does the omission of blood-test results on these persons bias the estimate and vitiate our generalizations?

Perhaps an estimate is needed of the prevalence of certain diseases in a community, based on the results of a screening examination—a mass blood-testing, mass X-ray, or multiple screening program. Will the nonrespondents show the same results as those who are examined—the volunteers or those examined as members of groups (as in industrial programs)?

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Do those who know they have the disease in question stay away from the clinic or come in for a check-up? Even if a population sample is obtained, what is the effect on the survey results of those who will not allow themselves to be examined because they know they have the disease, don't want to "know for sure," or are ill from other causes? And even if they do allow themselves to be examined, when an attempt is made to make findings of the screening survey more specific by securing diagnoses on suspects, what is the effect of the physician's hesitancy to make a diagnosis or his unwillingness to report it? Is the physician more or less willing to report a diagnosis if he knows that the person being screened has previously been diagnosed as having the condition which is being studied?

Another area in which lack of information about part of a group may influence results is in investigations of the effectiveness of a particular type of treatment on a selected group of persons. In this group will be some patients for whom post-treatment observation is not complete because of the patient's unwillingness to be examined, because he moved out of the area of the study, or because of death from other or unknown causes.

We have used data from the Richmond, Va., and Atlanta, Ga., multiple screening projects, from the Mississippi blood-testing projects, and from a special follow-up study of the Division of Venereal Disease to analyze the effect of nonresponse of patients on prevalence estimates and also on case finding and evaluation of treatment.

# Richmond Project

The Richmond multiple screening project was designed to discover syphilis and other diseases detectable by blood testing and other diagnostic methods, and to educate the public regarding these conditions. Suspects—persons screening above or below specified levels or with abnormal readings—were referred to physicians, who were asked to report their diagnoses to the health department on forms provided for the purpose. To evaluate the effectiveness of this project as a case-finding program and to estimate the prevalence of certain diseases in the Richmond population, information was needed on (a) who responded to the appeal and who did not and (b) whether physicians examined all suspects and reported the results of all examinations to the health department or whether the recorded results were biased.

The Richmond multiple screening survey was intended to reach persons 15 years of age and over. Of the total 37,609 persons who were screened, 37,498 were known to be 15 years old or over, of known sex, and either Negro or white. Comparison of the respondents in the survey with the 1950 census of Richmond showed that the survey population had a more than proportionate share of white females, and therefore was not in proportion to the census as to race and sex.

About one-fourth of the white female respondents, all aged 25 to 34, were tested, whereas examinations were made of only one-seventh of the total population of the city. Negroes, both male and female, were poorly represented in all age groups. The young and the old of both races did not participate as well as did the middle-aged.

If the prevalence of diseases were related only to sex, race, and age, the findings for each group in the survey could be expanded to the total population of Richmond. But perhaps prevalence of disease is in part dependent on socioeconomic status or on quality of disease prevention or medical care, which also may be based on socioeconomic status. Education is usually considered a good index of this status, and records were available for persons tested in Richmond.

Persons going through the screening line were

questioned regarding their education. Data on schooling from the 1950 census for Richmond are not yet available but, unless there has been a great change since 1940, it would appear that the screenees are better educated than the general population of the city. This is true for all four race-sex groups. Although the population of Richmond in 1950, by sex, race, age, and schooling, is not the same as in 1940, the percentages of 1940 groups going through the screening line are presented in table 1. While these percentages obviously are not valid for 1950, their relationship may be. The group with the highest representation in the screening line was composed of Negro female college graduates, followed by white female college graduates. Next came white females with 1 to 3 years of college, and then Negro male college graduates. The white college man was the poorest in attendance of all the college groups.

Table 1. Percent of 1940 population over 25 years of age going through screening line, by years of school completed, race, and sex, Richmond, Va., January-July 1950

School years completed	White		Negro	
	Male	Female	Male	Female
None.....	1.5	2.5	1.8	0.7
Grade school:				
1-4.....	10.7	11.6	7.0	3.4
5-6.....	11.6	18.2	8.7	5.8
7-8.....	13.2	26.4	16.0	11.7
High school:				
1-3.....	19.0	39.8	22.8	19.6
4.....	32.5	57.2	33.3	33.4
College:				
1-3.....	36.4	62.6	54.1	43.0
4.....	35.7	67.2	58.2	76.4
Total college.....	36.0	64.3	56.2	54.7
Not reported.....	43.0	64.1	63.5	48.7
Total.....	21.4	41.2	13.2	11.7

In each group studied, more white females attended the clinic than white males. In each group other than college graduates, the white female attended better than the Negro female. In all but two groups (high school and college graduates), the Negro male attended better than the Negro female, and, in all groups above the high school level, the Negro male attended better than the white male. For all sex-race groups, increase in attendance was associated with increase in education. Thus, the poor at-



tendance of Negroes at all ages may be a result of lack of education. Obviously, then, no generalizations for the entire population of Richmond can be made from results of the screening survey, since the attendance of respondents was biased in favor of whites, females, and the better educated.

Other characteristics of the respondents and nonrespondents in Richmond not revealed by the survey records are reported by the Health Information Foundation, which conducted an analysis of the multitest clinic (1). The foundation reports that the respondents usually come from the middle-income group rather than from the high- or the low-income group, from households with a low average number of persons, and from households where some member is covered by health insurance.

The next problem considered was the non-response or incomplete diagnosis by physicians, due either to the screenee's unwillingness to visit the physician or to the physician's hesitancy to report his findings. Physicians whose surnames began with the letter B were chosen as a sample, and the forms for all persons who had been referred to these physicians were withdrawn from the files. There were 93 physicians in this group, to whom 1,102 suspects had been referred. Hypertension was selected as a test to determine if the high proportion of previously known cases reported might be due to a tendency of physicians to return the report form on previously known cases and to withhold it in cases where a new diagnosis had to be established. Although the percentage of forms returned increased with the number of suspects referred to the physician, there was no relationship between the percentage of returns and the percentage of "condition present" (table 2). Neither was any relationship found in the percentages having hypertension either newly diagnosed or previously known. Thus, it would seem that in estimating the number of conditions diagnosed from the partial returns by physicians no obvious bias is introduced.

#### Atlanta Program

The Atlanta multiple screening program was designed to blood test and X-ray large numbers of persons to find syphilis, tuberculosis, and

Table 2. Comparison of number and percent of "conditions" identified by physicians with number and percent of forms returned, Richmond Multiple Screening Survey

Percentage of forms returned	Physicians reporting	Suspects reported	Forms returned	Condition identified as present	
				Number	Percent
0-69-----	30	324	99	47	47.5
70-89-----	5	333	270	122	45.2
90-100----	17	401	388	189	48.7

NOTE: More than one "suspect" referred to each physician in group whose surnames began with letter B.

other suspected conditions, through examination of the blood and the chest. Because of the large-scale nature of this endeavor, it was decided to concentrate on case finding and not to attempt to obtain data extraneous to that objective. Data on each individual responding to the appeal to come to the clinic were limited to age, race, and sex; no information was requested regarding schooling, income, or other socioeconomic factors.

Large numbers of persons were tested in Atlanta and large numbers with previously unknown conditions were discovered. But how successful was the project in terms of its potential? In making both case-finding and prevalence estimates, can it be assumed that the proportion of the population tested is the same as the proportion of the existing conditions found? In other words, as far as the condition being sought is concerned, do people come to the clinic at random? The 1950 census figures will indicate whether the young or the old, males or females, whites or nonwhites came in.

Unlike Richmond, Negroes are heavily represented among the respondents, with better representation than white persons for both sexes and at all ages. Moreover, the groups 15 to 34 years of age responded most. This is true of both races and both sexes. But how about the rich or the poor, the well educated or the not so well educated? Schooling was not checked on the Atlanta forms. The Bureau of the Census is currently preparing a tabulation for us which compares the education and income of the head of the house of the respondents and of the nonrespondents to the survey.

But how about biases inherent in the conditions themselves? Do the people who have syphilis or tuberculosis or diabetes come in to the clinic or stay out? More particularly, do the people who have been previously diagnosed as having a disease stay out or come in? The only way to find out is to examine either all or a sample of the nonrespondents.

Ideally, a sample should be selected before a screening project begins. After the project is completed, an attempt should be made to find and to examine those who did not respond to the public appeal. Since this had not been done, it was hoped that it would be possible to select a sample of the Atlanta population immediately after the project, check the responses against the survey records, and then attempt to examine the nonrespondents. However, funds were not available for a project of this type, so arrangements were made for analysis of a small sample of Negroes. This sample was selected by us and interviewed by staff members of Atlanta University, both for social-anthropological characteristics and for their participation in the Atlanta multiple screening program. The records were matched against the multiple screening records, and the sample of persons, all of whom were 15 years of age and over, was divided into two groups: those who responded to the appeal to come to the clinic for multiple screening; and those who did not. Letters were sent to all those not identified as respondents, inviting them to come to the city clinic for a chest X-ray and blood tests for syphilis, diabetes, and anemia. Few of the letters were returned as nondeliverable, and many of those in the sample selected came in for an examination.

One difficulty encountered was that this project was considered as research, for which insufficient funds were available. However, through the courtesy of the Georgia Division of Venereal Disease Control, two investigators were lent to us for 2 weeks, and an additional group of persons in the sample was induced to take the examination. At the end of 2 weeks the investigators returned to their usual tasks, leaving 560 of the 1,208 in the sample unexamined.

Because of the high percentage of positive blood tests (approximately 30 percent), it was

decided that further follow-up would be profitable. After the investigators had done their best to get the nonrespondents to come in for examination, teams went into homes and offices in an attempt to obtain blood from the most uncooperative cases. Because of technical difficulties, this test was limited to the blood test for syphilis.

Altogether, there were 2,449 Negroes 15 years of age or over in the sample examined. Of this number, slightly more than half responded to the survey appeal; of these, 84 percent were eventually tested for syphilis. The remaining 16 percent were listed as "uncooperative," "moved," "died," and "could not locate."

The results of the different phases of follow-up are given in table 3. The percentage of positive blood tests at all ages is much higher in the nonrespondents than in the original respondents to the survey. Moreover, the percentage is higher in the second phase of the follow-up of the nonrespondents in the sample than in the first phase, indicating an unwillingness to respond on the part of those with a high positivity rate. We cannot explain the lower rate in the most resistant cases—those which had necessitated a blood test at home. However, this rate is still much higher than the rate for the original respondents. Presumably then, in Atlanta, there were more cases of syphilis among those Negroes who stayed away from the survey than among those who came in.

X-rays for tuberculosis also showed a slightly higher percentage of positives among the nonrespondents (2.2 vs. 1.7) than among the respondents. However, for anemia and diabetes the opposite was true: the respondents showed higher abnormal rates than the nonrespondents (anemia, 9.6 vs. 8.2; and diabetes, 5.4 vs. 3.1).

### Mississippi Project

A special syphilis case-finding project in Mississippi also provides data on nonrespondents. This project included an appeal to the public to have blood tests. At the end of a designated period a team went into homes and attempted to get samples of blood from those who did not respond to the appeal. In 9 out of 11 counties the percentage of positive blood tests among those tested at home was higher than among

**Table 3. Results of serologic tests for syphilis for Negroes tested during the Atlanta multiple screening survey and as a result of follow-up**

Age (years)	Respondents		Nonrespondents					
	Number	Percent	First phase		Second phase		Tested at home	
			Number	Percent	Number	Percent	Number	Percent
15-24-----	279	9.7	75	10.7	27	11.1	13	15.4
25-34-----	311	21.2	132	31.8	38	36.8	29	41.4
35-44-----	290	26.6	109	42.2	42	45.2	18	16.7
45-54-----	199	28.1	93	34.4	34	44.1	12	50.0
55-64-----	102	25.5	80	30.0	14	50.0	13	23.1
65 plus-----	60	10.0	51	27.5	19	31.6	6	16.7
Total <sup>1</sup> -----	1,241	20.8	541	30.7	174	36.8	91	29.7

<sup>1</sup> Includes one case, age unknown.

those who volunteered. In the 11 counties, the syphilis rate for nonrespondents was 11.8 percent compared to 8.0 for the respondents.

#### Georgia Case-Finding Project

A special case-finding project was carried out in a town in Georgia where, after the initial survey, an attempt was made to test the whole population. A slightly higher percentage of positives and a considerably higher rate of previously unknown syphilis was found in the nonrespondents than in the respondents (2).

#### Effect on Therapy Evaluation

Therapy evaluation is another area in which nonresponse affects finding of relapsed cases and estimates of prevalence of diseases needing re-treatment. Here we start with a group of persons who are known to have, and who know they have, a condition requiring medical treatment. They are treated and, whenever possible, all or part of the group are examined periodically, in an attempt to identify the persons who relapse or progress, and to determine failure or re-treatment rates. As in the usual type of case-finding project, the purpose of the follow-up is twofold: to find the failures and offer them further treatment; and to calculate failure or success rates. To induce treated persons to return for post-treatment observation, reliance can be placed on patient education and the patient's interest in his own health; on let-

ters urging him to protect his health by coming in for an examination; on follow-up by a worker who visits him and urges him to return to the clinic; and on visits to his home or place of business, where he can be at least partially examined.

#### Division of Venereal Disease Study

A special intensive follow-up study made by the Division of Venereal Disease affords opportunity to observe differences in re-treatment rates among patients followed up by special "research investigators" and patients followed routinely—by patient education or by letter (3). Both groups of patients were treated by the same clinics, during the same period, and by the same methods of treatment, the only difference being in the method of follow-up. Of the group followed routinely, 42 percent were observed for 2 years; of the intensively followed group, 92 percent. No sizable differences between the failure rates were noted after the first year (table 4). Throughout the first year, the cumulative failure rate is higher in the group that was observed more completely, possibly due to earlier detection of relapses. In the early months of observation, the seronegativity rate in the intensively followed group was higher, again undoubtedly due to more complete examinations. However, at the end of 2 years there was no appreciable difference between the re-treatment rates of both groups.



Table 4. Cumulative re-treatment rates of secondary syphilis patients in a group followed intensively and in a group followed routinely

Observation period (months after treatment)	Intensive follow-up (250 patients)	Routine follow-up (1,856 patients)
3	1.6	0.7
6	6.4	4.8
9	10.9	7.9
12	11.7	11.1
15	12.9	13.2
18	13.7	13.9
21	15.0	14.8
24	15.0	15.8

### Summary

1. Failure to respond to an appeal to "know for sure," when addressed to persons who are apparently well or who are being treated for various conditions, presents problems for both the case finder and the statistician.

2. Evidence from Richmond, Va., and Atlanta, Ga., suggests that the general public does not respond to such appeals at random, but that certain segments of the population respond better than others, because of the type of appeal or because of other factors.

3. These differences in response affect the observed prevalence of some diseases in the groups responding, when the presence of these conditions is affected by age, race, sex, or socioeconomic or other factors.

4. Knowledge of the presence or absence of the conditions being studied may affect the person's decision to respond to the appeal to have an examination.

5. Data from both Atlanta and Mississippi show higher syphilis prevalence in nonrespondents. In Atlanta, somewhat higher tuberculosis rates, but lower anemia and diabetes rates, are found among nonrespondents than among respondents.

6. Data from the Richmond multiple screening survey show no differences in the proportion of morbidity reported by physicians for suspects referred to them, regardless of the percentage of suspects reported on.

7. Data from the Division of Venereal Disease of the Public Health Service show no differences at the end of 2 years in cumulative re-treatment rates between a group of patients followed routinely (42 percent) and a group followed intensively (92 percent).

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- (3) Bauer, Theodore J.: Evaluation of antisyphilitic therapy with intensive follow-up. I. The plan. *J. Ven. Dis. Inform.* 32: 355-359 (1951).

## Recommended Reading About World Public Health

In the American Journal of Public Health for December 1951: "International Health—A Symposium;" including—1. Introductory Remarks, C.-E. A. Winslow; 2. The Role of WHO, Past, Present, and Future, Brock Chisholm; 3. Some Aspects of the WHO's Programs in the Americas, Fred L. Soper; 4. Application of WHO Programs and Policies in a Region, Chandra Mani; 5. Bilateral International Health Programs of

the United States, Henry Van Zile Hyde; 6. Our Stake in World Health, Frank G. Boudreau. (This symposium summarized also in *Public Health Reports* for February 1952.)

In The Annals of the American Academy of Political and Social Science for November 1951: "The Search for National Security," including—Public Health and Foreign Policy, Leonard A. Scheele.

# Effective Use of Dental Assistants

By GEORGE E. WATERMAN, D.D.S.

Provision for adequate personnel to meet current demands for dental care services poses a challenge to the dental profession. Proved preventive measures can reduce the need, but, even if it were possible to apply preventive measures on a nation-wide scale, the need for dental care services would greatly exceed the capacity of the dental profession to supply them. And the prospect of a real increase in the number of dentists within the immediate future is not good.

According to Schoeny (1), "As nearly as it is possible to estimate, 9,200 dentists over and above those now in sight for the year 1954 will be required to maintain the present level of civilian dental services, to meet the special needs of industrial mobilization, to meet the minimum needs of an adequate civil defense program, and to meet the projected needs of the Armed Forces based upon a ratio of 2 per 1,000 troops strength. It is at once apparent that a substantial deficiency in dental manpower is already upon us and this deficiency is steadily increasing. It will not be possible to avoid or even reduce this deficiency before 1954. Whatever the demand, the present supply of dentists must meet all needs until then, or as soon thereafter as the training of additional dentists not now in process of education can be completed."

It seems imperative, therefore, that serious

consideration be given to other means of increasing our capacity for providing dental care services.

One of the most rational and noncontroversial means of meeting this problem is through the effective utilization of trained assistants. The medical profession is far ahead of the dental profession in the use of auxiliary personnel. Physicians long since have realized the necessity and importance of increasing their professional services through effective use of auxiliary personnel.

Klein (2) estimates that the patient load per dentist can be increased from 33 to 75 percent through the use of trained assistants (fig. 1). Moen (3) found a great variation in the number of patients treated per dentist, according to whether or not the dentist employed auxiliary help. He found that dentists who employed one assistant averaged 37 percent more patients than those without such employees, while dentists employing two assistants averaged 69 percent more patients. These estimates are probably conservative.

Klein (2) also has estimated that approximately 55 percent of the dentists of this country employ dental assistants. Reporting for the bureau of economic research and statistics of the American Dental Association, Moen (4) found that 65.5 percent of the dentists responding to a survey employed at least one full-time dental assistant, technician, or hygienist. He estimated the total number of full-time dental assistants to be 55,200, assuming that there are 76,000 practicing dentists.

Unfortunately, only a relatively small number of dentists employing assistants utilize them to their full potential effectiveness. A review of the literature reveals a striking lack of specific information regarding the techniques

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*Dr. Waterman directed the Richmond (Indiana) Dental Study. He is now with the Division of Dental Public Health, Bureau of State Services, Public Health Service. The paper was presented before the American Dental Association, October 17, 1951.*

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of good chairside assistance. Much time and space has been devoted to instruction in such duties as keeping the office neat and attractive, proper maintenance of equipment, sterilization of instruments, processing X-rays, making appointments, bookkeeping, and answering the telephone. All of these duties are essential to the efficient operation of a dental office or clinic. But it is unrealistic to expect that one dental assistant can perform these duties and still give effective chairside aid to the dentist. Adequate personnel should be employed to take care of both types of duties.

### Use Requirements

The dentist should have a broad working concept of how to utilize assistants effectively. Through application of this concept and through experience, he must develop efficient utilization of personnel. The assistant must be fully informed of duty details and develop competence in their performance. Adequate auxiliary personnel must be available so that both the chairside assistance and the other duties of the office can be carried out efficiently and without interruption. Teamwork must be highly developed and coordinated.

Results to be expected are:

1. More dental-care services can be provided through use of a trained assistant because she

conserves the dentist's time by performing the numerous tasks incident to routine dental treatment, which the dentist would otherwise have to perform himself.

2. Quality of services is also improved because the dentist is under less physical and mental strain. He is able to concentrate his attention on what he is doing; he enjoys his work more, and, therefore, should produce better-quality work.

3. Better control of the patient is possible through the influence of an assistant.

4. Less mental and physical strain result since the activities incident to the service are being shared. The necessary armamentarium is as near as the dentist's hand. He can work from the seated position during the entire treatment procedure, and be less fatigued.

5. Provision of more services results in greater patient turn-over, which brings greater income.

6. The resultant increase in the number of patients treated decreases the tooth mortality rate per patient, reduces the incidence of caries through early detection and treatment, and makes available to the dentist more time for providing preventive treatment.

7. The technique of preparing cavities under water is readily accomplished with the help of a chairside assistant. Also, the appointment periods are shorter, resulting in less pain and discomfort to the patient.

These conclusions are based on the results of the Richmond study, where the emphasis has been placed on the effective utilization of dental assistants.

### The Richmond Study

The complex problem of accumulated dental needs among children provided the basis for a 5-year clinical study of dental care, which was carried on in Richmond, Ind., by the Indiana State Board of Health and the city of Richmond, with the cooperation of the Public Health Service. The study began in December 1946 and was concluded in December 1951. One objective was to explore, under practical operating conditions, the possibilities of extending the services of dentists through the effective utilization of qualified auxiliary per-

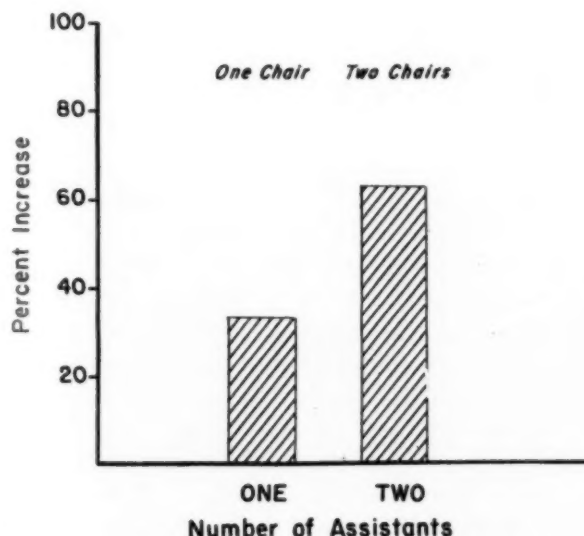


Figure 1. Percent increase in patients treated by dentists with chairside assistants. Percentage base is work of single dentist without an assistant—from Klein (2).



sonnel, and thus to provide a basis for intelligent appraisal of dental manpower requirements in this and comparable communities.

There was a personnel assignment of approximately one and one-half trained assistants per operator, plus necessary clerical personnel and two complete units per operator.

The following personnel were on duty: five dentists, seven dental assistants, two clinic clerks, one oral hygienist, one dental health educator, and one stenographer.

Complete treatment, with the exception of orthodontics, was provided annually to approximately 5,500 children, from kindergarten through junior high school. Service of high quality was required and provided. We found that increased services develop naturally as the operator masters the techniques of efficient utilization of trained auxiliary personnel.

Several months prior to the inception of this research program, representatives of the Division of Dental Public Health of the Public Health Service spent considerable time in the offices of Dr. Roy O. Elam, Nashville, Tenn. His counsel and his demonstration of the effective use of dental assistants indicated that such a method would be practical in school dental clinics. Dr. Elam was a consultant from the beginning of the study.

The five dental assistants initially assigned to the Richmond study received 10 weeks of intensive training at the Naval Dental School, Bethesda, Md. There was some turnover in personnel. A new trainee began as clinic clerk. In addition to clerical duties, she devoted time to training as a dental assistant. Most of the training was provided by the experienced assistants.

Training included close observation of clinic routine; instructions in maintaining cleanliness and in the techniques of sterilization; learning the names, numbers, and location of the various instruments, and the proper set-up of instruments on the bracket tables; and, finally, specific use of each instrument and the routine of its use by operators in a clinic. During this training, in addition to becoming proficient as a clinic clerk, the trainee became an "aide" to the second, or roving, assistant. Three to four weeks of such training usually proved sufficient to qualify a trainee as a full-time second, or roving,

assistant. Three weeks as second assistant usually qualified her to become a chairside assistant. A trainee normally developed into an efficient chairside assistant in from 6 to 8 weeks of training.

### Effect on Procedures

The use of chairside assistants modifies the usual procedure at the chair. The dentist, for example, can work from a seated position. The following description is illustrative.

Before the dentist takes his position on the operating stool, the chairside assistant has prepared the patient for treatment by properly adjusting the chair, and has provided the appropriate instrument set-up on the bracket table. If anesthesia is to be used, she prepares the syringe, hands it to the operator in such a manner as not to alarm the patient, and takes necessary precautions to guard against any sudden movement by the patient during the injection. As soon as the assistant knows which tooth is to be worked on, she places the proper bur or diamond instrument in the contra-angle and hands it to the dentist.

During the cavity preparation, the assistant flows water over the revolving bur or diamond instrument, retracts the tongue or cheek as required, using the saliva ejector to retract the tongue and her finger to retract the cheek. She dries the cavity for intermittent inspection and hands cutting instruments to the operator as required.

When the cavity is prepared, the chairside assistant isolates the tooth with cotton rolls and dries the cavity with cotton pellets and air. If a base is to be used, the dentist calls for it as the cavity preparation is being completed, so that by the time the cavity is ready for a base, a second assistant has mixed the cement and placed it on the bracket table; at this time she removes the contra-angle from the handpiece, replacing it with the automatic condenser containing the proper condensing point. The chairside assistant meanwhile has provided the matrix retainer and the band as requested. In a few seconds the operator can place the base and adjust the band. While he is doing this, the second assistant is mixing the alloy, which she places on a piece of gauze on the bracket

table. She removes all instruments from the table, with the exception of the condensers, carvers, mirror, explorer, and cotton pliers.

The filling material, in this instance alloy, is placed in the prepared cavity by the chairside assistant. As she places each carrierful, she hands the operator the condensers in the sequence in which he uses them.

During the carving of the filling, the chairside assistant hands the carvers to the operator in proper sequence, at the same time using the air syringe to blow away the amalgam scrapings.

Operators must develop techniques in which they use a minimum number of instruments and make proper use of such instruments to avoid confusing the chairside assistant. In this way the average assistant is soon able to anticipate the operator's every need.

While the chairside assistant is providing the afore-mentioned services, the second assistant is busy elsewhere in the clinic with such duties as preparing the next patient for treatment, cleaning and sterilizing instruments, mixing amalgam or cement, developing X-rays, or performing any one of the other innumerable duties. She also is capable of substituting for the chairside assistant at any time that it becomes necessary.

### **Film Demonstrates Use of Dental Assistants**



**Title: Dental Assistants—Their Effective Utilization, 16-mm., sound, color, 20 minutes, 1951 . . . Audience: dentists, dental assistants, dental students . . . Available by loan through State health departments; by purchase from Byron, Inc., 1226 Wisconsin Avenue, NW., Washington, D. C.**

These pictures from the Public Health Service motion picture show how dental assistants were used in the 5-year dental health demonstration project in Richmond, Ind., sponsored by the city, the State health department, and the Public Health Service's Division of Dental Public Health.

The advantages to both dentist and patient of using two chairs and two dental assistants are shown for several dental procedures.

Every effort is made to conserve the time of the dentist. Each operation is analyzed to determine just which parts of the work should be delegated to assistant personnel.

### **Time and Motion Saved**

In preparing the script of a motion picture (see illustrations) of the clinical aspects of the Richmond study, it was necessary to list the activities of the dentist, the chairside or first assistant, and the roving or second assistant. Including the seating of the patient, anesthesia, cavity preparation, the filling of three teeth with amalgam, carving of fillings, and dismissal of the patient, the number of activities were as follows: dentist, 33; first assistant, 57; second assistant, 39. The technique followed was routine; the number of instruments used and movements required were kept to a minimum consistent with high-quality service.

For this type of three-filling procedure, the difference in the workload when done by a dentist alone, with one, and with two assistants is shown in figure 2.

True, many of the activities performed by the dentist and the first assistant were synonymous, such as handling and receiving the various instruments. Such activities totaled 22,

The film does not attempt to present the technique of training dental assistants to the high degree of coordination and timing demonstrated in the film, but it does emphasize that this training is not difficult and that much can be accomplished in as little as 6 weeks.

The film underscores the concept that multiple chairs and assistants are one answer to the big question: "How can a limited number of dentists take care of an increasing number of people seeking dental attention?"

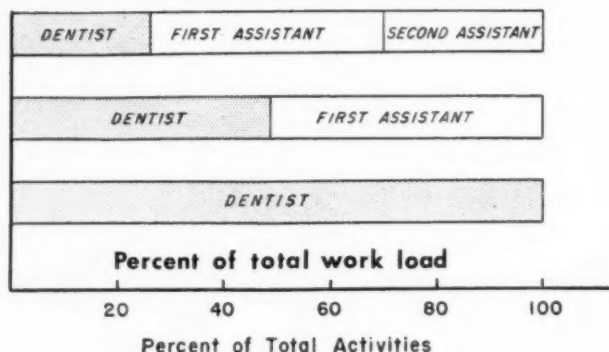


Figure 2. Effect of chairside assistance on dentist's workload.

leaving a total of 35 separate and distinct activities performed by the first assistant, which, if she were not constantly at the chairside, would have to be performed by the dentist. The activities did not include the necessary duties of the second assistant, such as preparing cement for the cement base, mixing amalgam, and cleaning and sterilization of instruments. Every conscious movement of efficiently utilized personnel should be a timesaver to the dentist.

#### Comments

This type of routine, utilizing chairside assistants as developed in the Richmond study, should be readily adaptable to the average dental office. This routine necessarily will have to be adjusted to the type of practice; to the physical set-up, such as equipment and office arrangement; and to the dentist's operating techniques.

Practical experience with efficiently utilized auxiliary personnel will convince a large ma-

jority of the dental profession that here is a means of providing, quickly and economically, a great increase in dental care services to the population. It is a method which requires a minimum of effort by the dentist and yet will provide maximum economic returns.

#### Summary

The demand for dental care services exceeds by far the present output of the dental profession.

It is unlikely that there will be any appreciable increase in the number of dentists in the foreseeable future.

The effective utilization of dental assistants presents an opportunity to bring about a substantial increase in dental care services.

Such a method is economical, readily available, and pleasant.

The use of dental assistants in the Richmond (Ind.) Dental Demonstration Study, their training, their duties, and their effectiveness, are described.

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### Persons With Eye Disabilities Successfully Employed

Under the State-Federal program for vocational rehabilitation, more than 8,000 men and women with eye disabilities that interfered with their livelihoods were rehabilitated into successful employment during the past fiscal year. One in ten of these men and women had never worked before their rehabilitation.

Since 1943, the State agencies, working in cooperation with the Office of Vocational Rehabilitation, Federal Security Agency, restored work ability to nearly 48,000 men and women with substantial visual impairments. About 18,500 of these rehabilitants were blind when they applied for services.



# Cancer Reporting and Register Program

By ANITA K. BAHN, B.A.

Reporting and registration of cancer illness can serve a twofold purpose in cancer control—provision of services to patients and collection of statistics needed for program planning. To further these aims, a pilot cancer morbidity reporting program has been operating in four Maryland counties during the past 3 years under the cooperative direction of the Maryland State Department of Health and the National Cancer Institute, Public Health Service. The first detailed statistical report on cancer case information derived from the program will be published later as a monograph. This paper summarizes the project findings and outlines the techniques utilized in obtaining the data.

## Procedures

A detailed description of reporting and register procedures in Maryland appears in the Manual on Cancer Register, Maryland State Department of Health (September 1, 1951). These procedures are described briefly here.

### Reporting

Every physician, hospital, clinic, and pathological laboratory in a county is requested to report all cancer cases, when first seen, to the county health department. Information is also obtained on cancer patients who are residents of a county but are diagnosed and treated in out-of-county facilities. This information is

obtained principally as a result of report interchange with other State health departments. To further augment available information, death certificates and other health department records are routinely searched for unreported cancer cases. A report is then requested from the appropriate medical agency.

A "visible" register card file serves not only as the local health department record of cancer case information but also as a guide for nursing supervision and follow-up. Signals indicate (a) cases under public health nursing care, (b) the nursing district in which every registered case resides, and (c) the month a follow-up report is to be requested.

For each registered case, follow-up information is requested periodically from the supervising physician or clinic. Follow-up is semi-annual during the first year after the case is reported and annual thereafter, throughout the patient's life. This procedure provides information concerning the progress and outcome of each case, in addition to stimulating medical follow-up of the cancer patient.

### Public Health Nursing Service

Both the initial case report and follow-up forms include the question: "Do you wish public health nursing service for your patient? If Yes, a public health nurse will call you for instructions." This item facilitates the provision of service to cancer patients and also serves as a continuing reminder to the physician of the service aspects of the program. In many instances, for example, the public health nurse has been called upon to visit a patient who fails to keep an appointment and to help arrange his return for treatment or check-up.

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*Mrs. Bahn, formerly a biostatistician at the National Cancer Institute, is now a biostatistician at the National Institute of Mental Health of the National Institutes of Health, Public Health Service.*

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### Summaries and Analyses

Reporting record cards and simple administrative reports prepared by the local register clerk help to keep local and State health department personnel informed of register activities.

Detailed tabulations and analyses are prepared in the State Department of Health, where special tabulating facilities and personnel trained in statistical techniques are available.

The State records consist of a single alphabetic file of case folders, divided into active and inactive cases. Each folder contains all the reports received on a case. In addition, for each calendar year there is a file of punched cards, one card for each case active during the year. These cards may be used for annual tabulations, or cards for more than 1 year may be combined for analyses requiring a large number of cases.

As a result of such procedures as the use of the same code sheet for a 10-year period and the coding of information (other than new cases) only once a year, practically all coding and punching is completed in a relatively short period of time. More clerical time is therefore available for such tasks as assisting in the preparation of analyses of the data. After all, without adequate summaries of the cancer experience reported, the data in the files serve no useful purpose.

### Staffing Requirements

For the successful operation of a cancer register of the kind and scope described, the services of the following types of personnel are required: in the local health department, the county health officer, public health nursing supervisor and staff nurses, and a secretary or clerk; in the State health department, a medical officer, public health nursing supervisor or consultant, statistician, clerical personnel, punch card operators, and machine tabulating personnel.

It is not necessary that these services be full-time. Each type of person enumerated, however, has special skills to contribute to the efficacy of the program. The assistance of the county health officer, county and State public

health nursing supervisors, and State cancer control director, for example, although largely advisory, is essential for the guidance and maximum utilization of the register, and the acceptance of the program in the community.

The question naturally arises as to how much time is required to operate a program of this type. It did not seem practical to determine the amount of professional time involved, but it was possible to conduct a 2-month study to determine the number of clerical man-hours required to operate the cancer register program in the local and State offices. The table below indicates that little more than two clerk-days a month (or approximately one-half clerk-day a week) are required to maintain a cancer register in a local health department serving a population of approximately 80,000.

Number of man-hours required per month to operate local cancer register (exclusive of nursing service)

County <sup>1</sup>	County population (1950)	Active registered cases (June 30, 1951)	Man-hours per month to operate register
Harford .....	52,000	83	6½
Frederick .....	62,200	228	16¼
Washington .....	78,700	368	16¼
Total .....	192,900	679	39¼

<sup>1</sup>Montgomery County, with a population (in 1950) of 163,700 and 427 active registered cases on June 30, 1951, is not included, since the register work performed in this county during the 2 months of the time study was atypical of routine procedures.

Although, in comparison with other local health department operations, relatively little time is spent on cancer register activities, it is interesting to see how this time is accounted for by type of cancer register activity. The total 39¼ clerical hours per month for cancer register work in the three counties is distributed as follows:

1. Receipt and posting of current reports and information to register card, and register services to public health nurses, such as transcribing information from cancer register card to nursing service record for cases newly opened to service—19½ hours, or 50 percent of the total time.

2. Sending requests for case reports to medical agencies known to have seen an unreported case—8¾ hours or 22 percent.

3. Sending requests for follow-up reports to medical agencies—7¾ hours or 20 percent.

4. Preparing administrative reports—3¼ hours or 8 percent. (This figure is somewhat higher than a true monthly average since a semi-annual report was prepared during one of the two months in which clerical time was recorded).

As reporting improves, the 8¾ hours (one-fifth of total register time) required to request case reports will be reduced. Differences between the counties in man-hours used in conducting register activities may be attributed in part to different reporting problems in each county.

In the State office, approximately 1½ persons are required full time to perform the routine register operations of filing reports, abstracting cause-of-death information, coding basic information for newly reported cases, correspondence, and occasional visits to the counties to discuss reporting and register problems. In addition, it takes 2 persons approximately 6 weeks annually to code current information on cases in the active register (2,000 cases in 1951), exclusive of the time used for preparation of punched cards and tabulations.

The above data illustrate that, from the standpoint of workload, the cancer register procedures developed in connection with this program represent a feasible and practical system of operation.

### Statistical Findings

What statistical findings with respect to cancer patients in the four counties have been revealed by this study? Findings of the first 2 years of operation are described in "Cancer Illness Among Residents of Four Maryland Counties, 1948 and 1949," which is to be published by the National Cancer Institute of the Public Health Service. A summary of this report follows.

The estimated total population of the four study counties (Frederick, Harford, Montgomery, and Washington) during 1948-49 was about 340,000, including urban, semirural, and

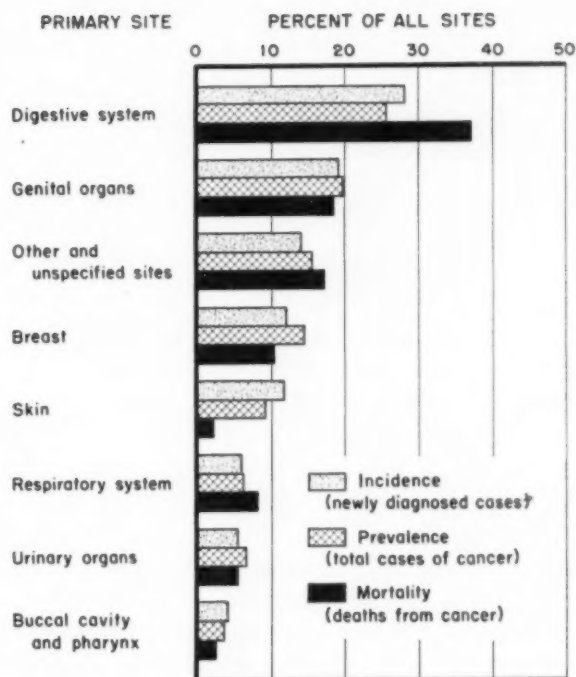


Figure 1. Comparison of cancer incidence, prevalence, and mortality in four Maryland counties, 1948 and 1949.

rural communities of varying sizes. In 1940, one-half of the population was rural nonfarm and one-fourth, rural farm. This is one of the few instances where data are available on cancer illness for an area with a large rural population. Therefore, it is interesting to compare the Maryland data with National Cancer Institute data based upon morbidity surveys of five urban areas (Atlanta, New Orleans, Pittsburgh, Denver, and San Francisco).

### Number and Kinds of Cases

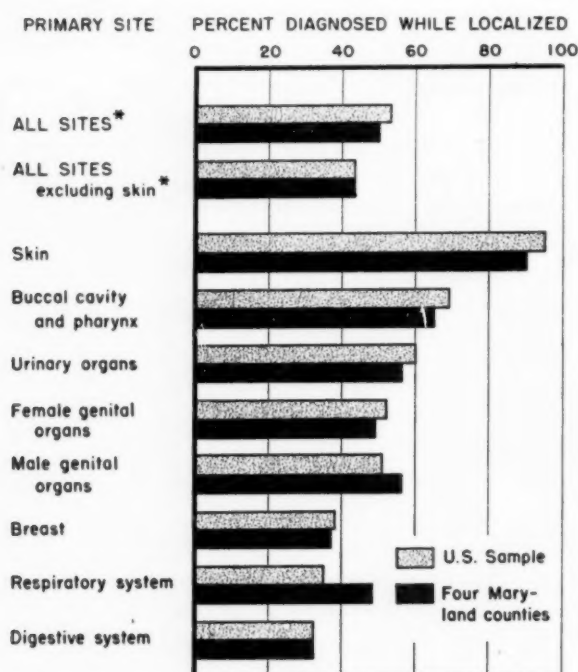
During 1948 and 1949, an average of 650 newly diagnosed cases of cancer was reported yearly among residents of the four counties in the study. Each year a total of 950 persons were reported ill with cancer, and 450 deaths were attributed to this disease. It is believed, however, that a substantial number of diagnosed cancer cases were not reported. Based on the number of registered county deaths and on the ratio of diagnosed cases to registered deaths in the group of five surveyed cities, it is estimated that there was actually a minimum of 1,300 persons ill with diagnosed cancer each year, 900 of these newly diagnosed. In the five surveyed cities, an average of three diag-



nosed cancer cases was found for each registered cancer death, two of which were newly diagnosed. In addition to the cases of diagnosed cancer, there was an undetermined number of undiagnosed cases which will remain undetected until later years.

More newly diagnosed cases of cancer were reported among females than among males during 1948 and 1949 in each county except Harford. A total of 737 cases in females was reported, compared with 600 cases in males (a ratio of 1.2 cases in females to each case in males). Five percent of the reported cases were in nonwhite persons.

The digestive system was the principal site of cancer among both male and female patients who were newly diagnosed (fig. 1). However, cancers of this site were relatively more frequent among males (31 percent of all cases in males compared with 26 percent in females). The skin and genital organs were the next most frequent sites among males; genital organs and the breast, among females. Together, the last two sites accounted for almost half of all cases in females.



\*Excludes leukemias and lymphomas.

Figure 2. Comparison of newly diagnosed cancer cases, diagnosed while localized, in four Maryland counties and in United States five-city sample. (Data based on cases for which stage at diagnosis was reported.)

Although some forms of cancer (lymphomas, leukemias, brain and bone tumors) occur frequently among younger persons, cancer is largely a disease of late adult life—70 percent of the newly diagnosed cases were among patients 55 years of age and over. In general, cases in the female were diagnosed at a slightly younger age than cases in males (an average of 60 years compared with 63). This may be explained in part by the predominance of malignancies primary in the genital organs and breast among females. Cancers at these sites occur at younger ages than do cancers that predominate among men (cancers primary in the digestive and respiratory systems, skin, and male genital organs). Incidence and prevalence rates per 100,000 population would greatly assist in the analysis of these data; unfortunately, these rates cannot be determined until a greater proportion of diagnosed cancer cases are reported.

The average cancer mortality rate per year was 133 deaths per 100,000 population in the four counties studied, compared with a mortality rate of 143 for the total United States. The mortality rate was highest in Frederick County (164 per 100,000) and lowest in Montgomery County (115). In part, these differences may be explained by the age composition of the county population. To evaluate the influence of age upon mortality, age-standardized mortality rates will be computed when 1950 population data become available.

#### Diagnosis, Treatment, Other Medical Care

It appears from the data collected that more intensive case-finding programs are needed to aid in the early discovery of cancer cases. Only half of the newly diagnosed cases were discovered while localized at site of origin (fig. 2). Three out of every ten cases were found after the neoplasm had metastasized to regional tissues, and 2 out of every 10, after remote tissues had become involved. Cancers of inaccessible organs generally went undiagnosed until a late stage. A smaller but still substantial proportion of cancers of accessible sites were also undiagnosed until a late stage. For example, 63 percent of all breast cancers and 51 percent of cancers of female genital organs were diagnosed after metastases had occurred.

Another criterion for adequacy of medical care is the proportion of diagnoses confirmed by microscopic examination. Of the cases newly diagnosed in 1949, 68 percent were confirmed microscopically, about the same percentage as that found in the United States sample of five cities.

Surgery alone was the primary course of treatment for over half of the cases for which information was available. Seventeen percent of the patients received radiation therapy only, while 8 percent were treated by both surgery and radiation. About 2 out of every 10 patients were not treated or received only palliative therapy. In this category were a relatively high proportion of cases of leukemia (75 percent) and cancers of the respiratory and digestive systems (45 and 34 percent, respectively). Nontreated cases were reported among these cancers even if discovered while localized. Some of these cases, however, may have received treatment which was not reported.

The average duration of first hospitalization for newly diagnosed cancer cases was 17 days. The total number of days of first hospitalization for cancer for patients residing in the four counties is estimated to be between five and six thousand yearly, including in-patient days in out-of-county hospitals. If all hospitalizations for cancer cases during a year are considered, regardless of the frequency of hospitalization or the date of diagnosis, one may estimate a total of 9,000 hospital days a year for resident cancer cases.

Another important index of the quality of medical management of cancer cases in a community is the continuity of medical care. Continuous medical supervision of cancer cases is needed to assure that a reappearance of cancer symptoms will be detected promptly. However, 83 persons ill from cancer in 1948 were not reported seen by any medical agency in 1949. Some of these patients were ill when last seen by a physician and had not returned for further treatment. Although one-fourth were cases of skin cancer, cases no longer under medical supervision were reported for cancers of the breast, digestive system, and other sites with relatively poor prognosis.

Since the performance of an autopsy is considered desirable for the confirmation of the

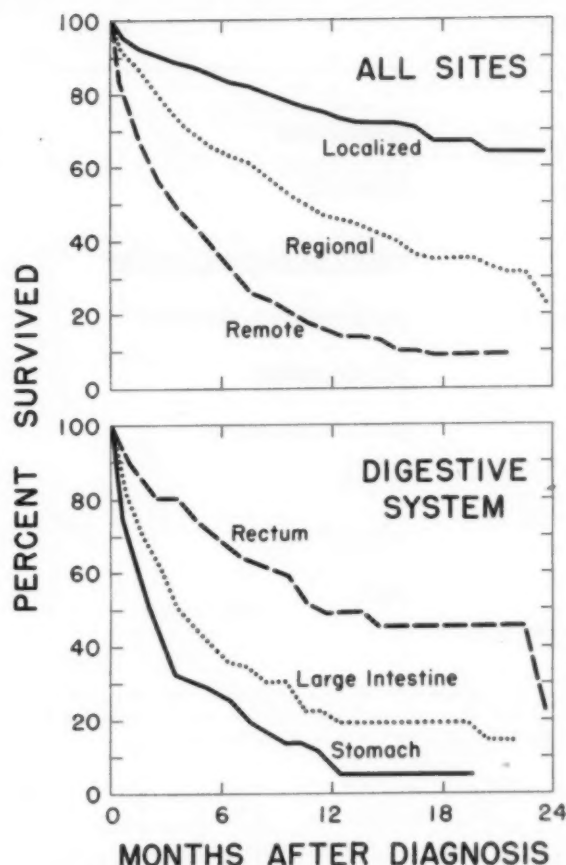


Figure 3. Survival experience of cases of cancer newly diagnosed during 1948 and 1949 in four Maryland counties, by stage at diagnosis and by selected site of cancer. (Survival for 24 months not shown in some instances, because of insufficient data.)

cause of death and for furtherance of knowledge of the disease, information was collected on whether or not an autopsy was performed for each death attributed to cancer. It was found that autopsies were performed in only 9 percent of cases in which cancer was reported as the cause of death. This percentage was even lower than the percentage of autopsies among deaths from all causes (12 percent).

#### *Survival and Apparent Recovery*

Rates of survival and apparent recovery from cancer are useful tools in measuring the success of cancer case management. Information on the probability of survival and recovery can also assist the physician in determining the optimum frequency of follow-up examination and the intervals within which the disease is most likely to recur.

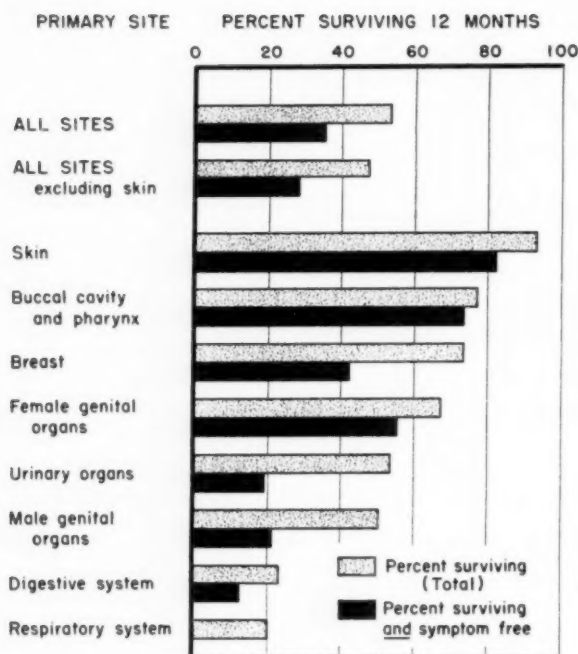


Figure 4. Comparison of total survival rates and symptom-free survival rates for cases of cancer newly diagnosed during 1948 and 1949 in four Maryland counties.

Calculated on the basis of a modified life table method, 53 percent of cases newly diagnosed with cancer in 1948 and 1949 survived 1 year after diagnosis; 37 percent survived 2 years. The rate of attrition was higher during the first several months after diagnosis than during subsequent months.

The chances of survival were considerably higher for females with cancer than for males—44 percent of females with cancer survived 2 years as compared to 28 percent of males. This difference is due principally to the larger proportion of cancers among males primary in sites with poor prognosis, such as the digestive and respiratory systems.

Survival rates by stage at diagnosis illustrate very strikingly the importance of early detection: 67 percent of cases diagnosed with a localized cancer survived 18 months compared to 35 percent for cases diagnosed with regional involvement and 9 percent for cases diagnosed

with remote or diffuse metastases (fig. 3). The lowest 18-month survival rates (5 percent) were among cases with cancer of the stomach (fig. 3). The survival rate of cancer of the respiratory system was also low (15 percent).

The 1-year survival rate of 53 percent for cases resident in the four counties is lower than the survival rate of 67 percent obtained for cases in the United States sample of five cities. To what extent this difference is a reflection of incomplete and selective reporting in the Maryland counties and to what extent the data represent true differences in survival experience of cancer cases cannot be determined at the present time.

The proportion of county cases diagnosed with cancer who were both alive and clinically free from cancer at the end of 1 year is estimated at approximately 35 percent (fig. 4). Thus, one might say that while half of all county residents who develop cancer will be alive one year after diagnosis, only one-third will be both alive and clinically free from the disease. All but 2 percent of those who die during the first year will die with cancer present at time of death.

Not only is there marked variation in survival rates by stage at diagnosis, there is also considerable variation in the proportion who are symptom-free among the survivors. The proportion of newly diagnosed cases alive and symptom-free at the end of 1 year represented 59 percent of the cases discovered while localized, and 23 percent of those diagnosed after regional metastasis.

Differences in survival and apparent recovery by cancer site and by county are shown in the detailed report. However, the relatively small number and selection of reported cases makes it unwise to consider these data as conclusive of true differences in survival experience. It appears essential to continue the collection of data on this and other aspects of cancer illness in the four counties.



# New Media for the Differentiation of Enteric Bacteria

By HECTOR COLICHON, M.D.

Although a number of methods have been devised for rapid identification of colonies of enteric bacteria which appear on plates of differential media inoculated with fecal material, further improvement of these methods is needed. The two media described here have been used successfully by the author, and it is believed that their adoption will result in more rapid recognition of the pathogenic genera and in economy of time, materials, and labor. The compositions and methods of preparation of the media are as follows:

## "IM" Medium

### A. Basic medium:

Proteose peptone (Difco)_____	10.0 gm.
Sodium chloride_____	5.0 gm.
IM indicator_____	10.0 ml.
Distilled water to make____	1,000.0 ml.

IM indicator is prepared by adding 0.4 gm. of thymol blue to 100 ml. of Andrade's indicator. The peptone and salt are dissolved in the distilled water, the reaction adjusted to pH 7.4, and the indicator added. The medium is distributed in 3-ml. amounts into 100 x 13 mm. test tubes which contain Durham inserts, and

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*Dr. Colichon is from the Instituto Bacteriologico, Lima, Peru. This is a revision of an article originally published in Revista Peruana de Pediatria. The new data here included were obtained while the author was working as a student in the enteric bacteriology unit of the Public Health Service Communicable Disease Center in Atlanta.*

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the tubes sterilized for 15 minutes at 15 pounds' pressure. Care should be taken that all air is expelled from the Durham tubes.

### B. Triple carbohydrate solution:

Lactose_____	30.0 gm.
Mannitol_____	1.4 gm.
Sucrose_____	1.4 gm.
Distilled water to make____	165.0 ml.

Substances of the highest purity obtainable should be used. After the materials are dissolved, the solution is sterilized by filtration, and stored in well-stoppered tubes in the refrigerator.

### C. Urea solution:

A 20-percent urea solution is sterilized by filtration, distributed in stoppered tubes and stored in the refrigerator.

Add 5.0 ml. of urea solution to 8.2 ml. of carbohydrate solution and pipette 0.4 ml. of the mixture into each tube which contains 3.0 ml. of the basic medium. Incubate for 24 hours to insure sterility.

## "SMG" Medium

### A. Basic medium:

Proteose peptone (Difco)_____	5.0 gm.
Tryptone (Difco)_____	15.0 gm.
Lead acetate (neutral, C. P.)_____	0.5 gm.
Sodium thiosulfate (crystals, C. P.)_____	0.2 gm.
Agar (Bacto, Difco)_____	14.0 gm.
Phenol red (0.2 percent solution) _____	15.0 ml.
Distilled water to make____	1,000.0 ml.

Dissolve the peptone, tryptone, and agar in a boiling water bath. Dissolve the lead acetate and the sodium thiosulfate in a small amount of distilled water and add to the peptone-tryptone-agar solution. Adjust the medium to pH 7.4 to 7.5 and add the indicator. Distribute in 100- or 200-ml. amounts in suitable flasks and sterilize for 15 minutes at 15 pounds' pressure.

**B. Double carbohydrate solution:**

Mannitol----- 20.0 gm.  
Glucose----- 2.0 gm.  
Distilled water to make----- 110.0 ml.

Dissolve the carbohydrates and sterilize by

filtration. Distribute aseptically in well-stoppered tubes in amounts of 5.5 or 11.0 ml.

To 100 ml. of melted and cooled basic medium add 5.5 ml. of the double carbohydrate solution, mix well, and distribute aseptically into 100 x 13 mm. tubes in amounts of 3.0 to 3.5 ml. Allow to solidify in a slanting position so that a deep butt is present. Incubate 24 hours to insure sterility.

In IM broth, urea utilization is indicated by production of alkali and consequent development of a blue color due to the presence of thymol blue. Acid production results in the development of a red color by the Andrade's indicator. The reading of the results in SMG

**Biochemical reactions**

Type of culture	IM broth			SMG agar			Remarks
	Urea	Acid	Gas	H <sub>2</sub> S	Acid	Gas	
<i>Shigella</i> :							
Mannitol fermenters-----	-	+	-	-	+	-	In some strains, acidity vanishes in IM broth; in others ( <i>S. sonnei</i> ) it reappears very late.
Nonmannitol fermenters----	-	-	-	-	-/+	-	
<i>Salmonella</i> :							
H <sub>2</sub> S positive-----	-	-	+	++	+	++	Sometimes produce small amounts of H <sub>2</sub> S.
H <sub>2</sub> S negative-----	-	-	+	-	+	++	
Anaerogenic-----	-	+	-	-/+	+	-	Some strains produce small amounts of gas in SMG medium. Do not ferment mannitol; but do ferment lactose or sucrose.
Paracolon ( <i>Shigella</i> -like):							
29911 strains-----	-	-	-	-	-/+	-	
Other cultures-----	-	+	-	-	-/+	-	Some strains acidify IM very slowly; others produce very little H <sub>2</sub> S. Usually indol positive. Ferment lactose. Very rare cultures.
Paracolon:							
<i>Salmonella</i> -like (Arizona, Ballerup and Bethesda).	-	-	+	++	+	++	
<i>Escherichia</i> -like-----	-	±	+	-	+	++	
Anaerogenic-----	-	++	-	-	+	-	
Urea positive (produce alkali).	+	-	+	-	+	++	
<i>Alcaligenes</i> -----	-	-	-	-	-	-	
<i>Pseudomonas</i> -----	-	-	-	-	-	-	Pigment is best observed in IM medium.
<i>Proteus</i> :							
Nonmannitol fermenters:							
<i>P. vulgaris</i> -----	}	-	-	+	-/+	±	Sometimes produce little H <sub>2</sub> S.
<i>P. mirabilis</i> -----		-	-	±	-/+	±	Sometimes produce little H <sub>2</sub> S.
<i>P. morganii</i> -----		-	-	-	-	-	
Mannitol fermenters:							
<i>P. rettgerii</i> -----	+	-	-	-	++	-	
<i>Escherichia</i> :							
H <sub>2</sub> S positive-----	-	+	++	++	+	++	
H <sub>2</sub> S negative-----	-	+	++	-	+	++	
<i>Aerobacter</i> -----	-	-	++	-	+	++	

**Key to the symbols:**

- negative.
- + positive.
- ± late, very weak, or may even fail to appear.
- /+ neutral or alkaline slant, acid butt.
- ++ strong or very strongly positive.
- /+++ negative to strongly positive.

agar is similar to the recording of reactions in Kligler's iron agar.

The media are inoculated with a thin platinum wire which is bent at an obtuse angle 1.5 to 2.0 mm. from its lower end. Each suspected colony is subcultured to IM broth, using a liberal inoculum which should be well distributed throughout the tube. The wire is sterilized and dipped into the inoculated broth, smeared on the surface of the SMG agar slant, and stabbed to the bottom of the tube. The tubes are incubated overnight at 37° C. The reactions of various groups of enteric bacteria in the two media are given in the accompanying table.

By incubating the tubes for several days, delayed fermentation of lactose or sucrose may become apparent. Often it may be desirable to test the action of the organisms on lactose, sucrose, adonitol, and salicin in the conventional manner. With many cultures, tests for indol, acetyl-methyl carbinol, citrate utilization, and motility will be necessary to confirm the tentative diagnosis.

The following notes may be helpful in the interpretation of the reactions:

1. Cultures which produce a strong acid reaction with abundant gas formation in IM broth and which do not blacken SMG agar are *Escherichia*.

2. When the amount of gas in IM medium is more than a small bubble, acid production is not apparent, and the turbidity is greater than usual; when a heavy growth is present in SMG medium, the inoculated organisms are not *Salmonella* or *Shigella* but are paracolon, *Escherichia*, or *Klebsiella*.

3. Cultures which produce a strong alkalinity in IM medium are *Proteus*. Reactions of different species are given in the table.

4. *Salmonella paratyphi A* and *Salmonella choleraesuis* do not blacken SMG agar.

5. Mannitol fermenting *Shigella* forms and anaerogenic *Salmonella* cultures produce similar reactions in the media and should be distinguished by motility and agglutination tests.

6. *Shigella* cultures which do not ferment mannitol produce no change in IM medium. *Shigella*-like paracolon strains and some *Proteus morgani* cultures give similar reactions but their greater growth vigor and characteristic odor aid in differentiation.

Growth from the surface of SMG agar may be suspended in saline and used as antigen in slide agglutination tests. Polyvalent *Shigella* serums, polyvalent *Salmonella* serums, and grouping serums for the two genera should be used to establish a rapid diagnosis of pathogenic forms which may be present.

### Summary

Two media, IM broth and SMG agar, are described. By simultaneous inoculation of these media with colonies from plates inoculated with fecal material, it is possible to establish a rapid diagnosis of the enteric bacteria present. By their use it is possible to determine fermentation of glucose, mannitol, lactose, and sucrose; gas production, urea utilization; and H<sub>2</sub>S production in two tubes. Results should be confirmed by appropriate biochemical and serological tests.

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## Clinical Traineeships

Graduates of approved medical schools may apply for clinical traineeships at the National Institute of Arthritis and Metabolic Diseases.

The new trainee program is designed to increase competency in the treatment and rehabilitation of arthritis patients. It will cover the prevention, diagnosis, and treatment of arthritis and metabolic diseases. Trainees without dependents will receive \$3,000 per year; with dependents, \$3,600.

For their course of study, trainees may select a qualified institution. Applicants must be American citizens not over 40 years of age, and must have completed a year's internship at an approved hospital.

Additional information and application forms may be obtained from: Chief, Extramural Programs, National Institute of Arthritis and Metabolic Diseases, Bethesda 14, Md.



# Venereal Disease Morbidity, 1951

## Syphilis Rates

In the 1951 fiscal year 198,640 cases of syphilis in all stages were reported for the first time to the Public Health Service. This represents a reported syphilis case rate of 132 per 100,000 civilian population. The geographic distribution of total syphilis cases reported per 100,000 population is shown in figure 1.

The number of syphilis cases reported has declined steadily since 1947. For the country as a whole, reported syphilis rates decreased by 49 percent, from 261 cases per 100,000 civilian population in 1947. In all States except Iowa, the reported syphilis rate has decreased as compared to 5 years ago (fig. 3). The relative size of the decreases in the various States does not appear to be correlated with the level of the syphilis rate in 1947. Since 1947 there has been a considerable decrease even in the States that had a low reported morbidity at that time.

## Factors Influencing Rates

A number of factors may account for the changes in syphilis morbidity rates in the last 5 years, and the relative importance of these factors may vary widely from State to State. These factors include the relative efficiency of case finding in 1951 compared to 1947, including both the type and intensity of case-finding effort; the size of the backlog of undiscovered cases, i. e. case-finding efficiency prior to 1947; completeness of reporting both during the 5-year period and prior to it; population changes during the period; and decrease in incidence not associated with effects of the

*The Division of Venereal Disease of the Bureau of State Services, Public Health Service, has prepared this section.*

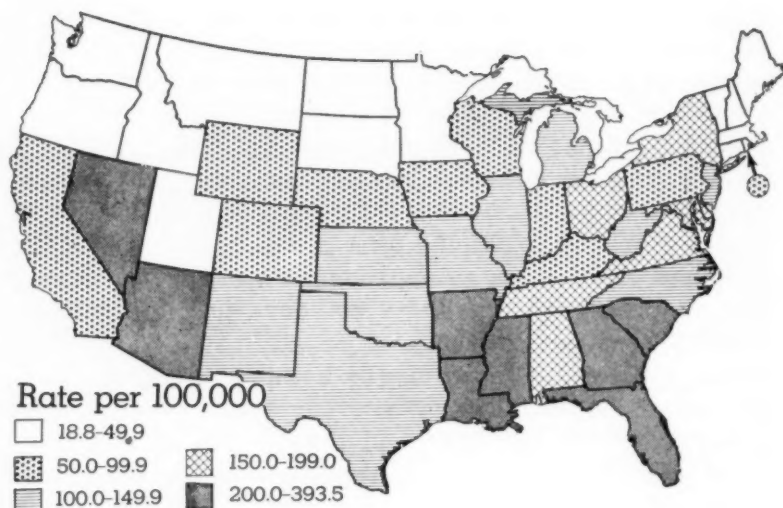


Figure 1. Reported syphilis case rates per 100,000 civilian population, fiscal year 1951.

control program, such as changing socioeconomic conditions and population mobility.

During the 5-year period there was no recorded evidence to indicate a letdown in case-finding activities. As far as public clinic activities are concerned, diagnostic observations

increased from 1,373,000 in the fiscal year 1947 to 2,359,000 in 1951. Neither is there any evidence to indicate that case-finding activities in fiscal 1951 were of poorer quality or less well directed at groups in the population who are most likely to be infected.

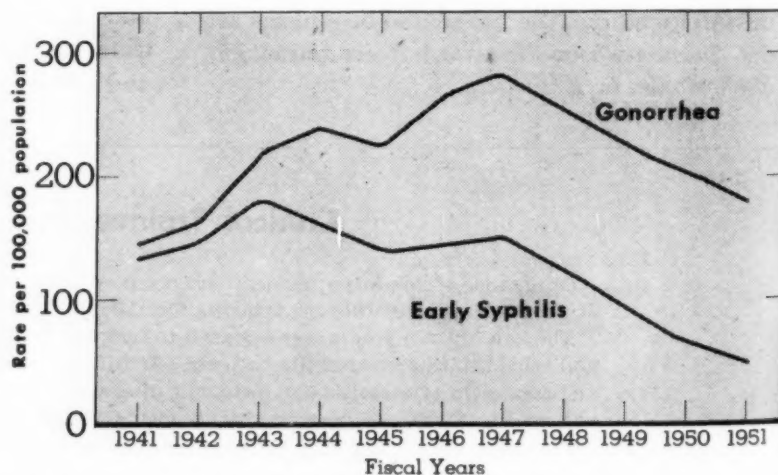


Figure 2. Trend in early syphilis and gonorrhea reported case rates, continental United States, civilians, fiscal years 1941-51 (includes primary, secondary, and early latent).

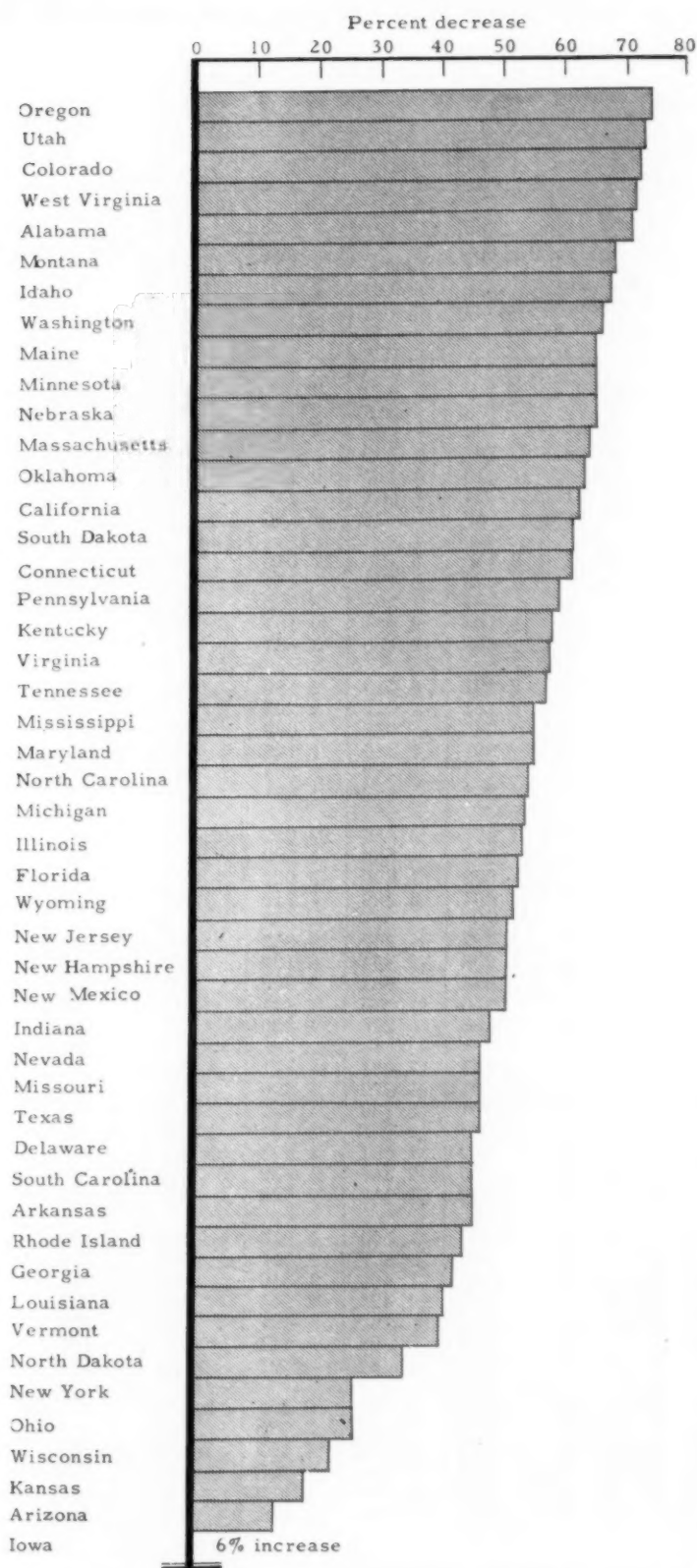


Figure 3. Percentage decrease in reported syphilis case rates for each State from fiscal year 1947 to 1951.

To understand the implications of syphilis morbidity statistics, it is important to realize that the stage of disease being reported may vary from primary to paresis, and the duration from less than 1 month to 30 years or more. All cases not previously reported, regardless of duration, should be included in current case reports. Therefore, the total of reported syphilis cases in any one year does not connote incidence data for that year even if case reporting were complete.

Because of the nature of syphilis, neither can prevalence data be directly inferred from morbidity data. Many cases in the population are excluded from current morbidity reporting because they have been previously reported for the same infection. While total syphilis morbidity or number of cases reported for the first time may not be properly applied directly to either incidence or prevalence, it has considerable value as an expression of the volume of successful case-finding activity.

Furthermore, the number of cases in the early stages of syphilis is useful as a minimum base for estimates of incidence, and the number of cases in the later stages may be considered as an indication of past case-finding failure. For the most part, gonorrhea cases reported may be used as a minimum base for estimating incidence. If these points are kept in mind, the data presented in the table and in the figures will be more meaningful. All data are for civilians only and by fiscal year.

#### Gonorrhea Declining Slowly

The trend in gonorrhea cases reported per 100,000 population has also been downward since 1947 (fig. 2). The numerical decrease has closely paralleled the decrease in early syphilis reported case rates (including primary, secondary, and early latent). Relatively, however, gonorrhea has decreased much more slowly. Reported gonorrhea rates in the fiscal year 1951 represent a decrease of 36 percent over 1947 while early syphilis rates decreased by 69 percent. In 1951, there were 179.2 cases of gonorrhea reported per 100,000 civilians.

**Cases of venereal disease reported to the Public Health Service by State health departments, fiscal year 1951**

[Known military cases excluded]

Federal Security Agency Regions	Syphilis						Gonor- rhea	Other venereal disease
	Total syphilis <sup>1</sup>		Primary and sec- ondary	Early latent	Late and late la- tent	Congen- ital		
	Number	Rate per 100,000 population						
Region I total.....	3, 526	37. 95	419	669	2, 061	222	3, 001	38
Connecticut.....	838	41. 73	76	315	362	41	697	16
Maine.....	321	34. 97	85	52	160	24	237	2
Massachusetts.....	1, 360	29. 08	187	205	873	95	1, 723	18
New Hampshire.....	184	34. 46	10	12	137	23	76	2
Rhode Island.....	648	83. 61	14	61	443	26	181	0
Vermont.....	175	46. 05	47	24	86	13	87	0
Region II total.....	39, 078	127. 81	2, 153	8, 196	27, 046	1, 240	31, 894	682
Delaware.....	598	187. 46	53	196	184	28	236	4
New Jersey.....	5, 173	107. 03	287	1, 551	3, 080	231	3, 940	49
New York.....	26, 173	175. 75	1, 165	3, 964	20, 101	694	18, 415	494
Pennsylvania.....	7, 134	67. 74	648	2, 485	3, 681	287	9, 303	135
Region III total.....	19, 550	158. 40	2, 491	6, 519	9, 186	1, 061	45, 869	1, 211
District of Columbia.....	3, 279	433. 16	82	917	2, 203	71	12, 542	406
Maryland.....	3, 850	166. 31	385	991	2, 083	206	7, 462	209
North Carolina.....	4, 595	113. 91	891	2, 210	1, 125	369	13, 667	369
Virginia.....	5, 211	161. 53	741	1, 769	2, 354	245	9, 223	207
West Virginia.....	2, 615	130. 10	392	632	1, 421	170	2, 975	20
Region IV total.....	24, 183	140. 12	1, 476	6, 154	12, 737	1, 196	20, 962	373
Kentucky.....	2, 908	99. 55	310	656	1, 600	318	3, 897	39
Michigan.....	8, 494	132. 99	559	1, 899	3, 922	277	8, 644	250
Ohio.....	12, 781	160. 75	607	3, 599	7, 215	601	8, 421	84
Region V total.....	16, 846	88. 16	1, 793	4, 147	9, 852	757	24, 572	669
Illinois.....	10, 516	120. 78	1, 206	2, 804	6, 109	397	20, 749	645
Indiana.....	3, 770	95. 42	334	982	2, 202	252	2, 373	20
Minnesota.....	586	19. 53	50	85	421	17	724	0
Wisconsin.....	1, 974	57. 20	203	276	1, 120	91	726	4
Region VI total.....	42, 790	255. 04	4, 941	13, 037	18, 871	4, 295	70, 575	2, 883
Alabama.....	5, 979	195. 78	604	1, 872	1, 596	330	3, 593	201
Florida.....	10, 494	382. 16	1, 301	3, 739	4, 971	483	13, 368	772
Georgia.....	7, 612	222. 70	1, 340	2, 008	3, 161	1, 103	14, 258	1, 217
Mississippi.....	8, 531	393. 50	682	1, 631	4, 812	1, 406	11, 502	293
South Carolina.....	4, 754	225. 74	465	2, 344	1, 632	313	7, 738	178
Tennessee.....	5, 420	164. 94	549	1, 443	2, 699	660	20, 116	222
Region VII total.....	10, 765	96. 81	1, 180	2, 593	5, 975	580	7, 306	95
Iowa.....	1, 853	70. 30	259	377	1, 052	108	767	4
Kansas.....	2, 168	114. 05	211	468	1, 350	109	1, 248	7
Missouri.....	5, 456	137. 50	577	1, 425	2, 943	298	4, 337	81
Nebraska.....	803	60. 24	62	160	427	37	633	3
North Dakota.....	252	40. 32	27	82	111	14	104	0
South Dakota.....	233	35. 46	44	81	92	14	217	0
Region VIII total.....	27, 744	184. 00	2, 480	8, 039	12, 205	2, 889	43, 176	1, 050
Arkansas.....	5, 729	299. 79	420	1, 701	3, 020	588	3, 518	122
Louisiana.....	9, 192	343. 63	709	2, 372	4, 102	1, 159	10, 163	601
New Mexico.....	965	142. 33	100	385	398	82	632	4
Oklahoma.....	2, 708	122. 04	252	587	1, 680	180	4, 910	82
Texas.....	9, 150	120. 47	999	2, 994	3, 005	880	23, 953	241

See footnotes at end of table.



# Cases of venereal disease reported to the Public Health Service by State health departments, fiscal year 1951—Continued

[Known military cases excluded]

Federal Security Agency Regions	Syphilis						Gonor- rhea	Other venereal disease
	Total syphilis <sup>1</sup>		Primary and sec- ondary	Early latent	Late and late la- tent	Congen- ital		
	Number	Rate per 100,000 population						
Region IX total.....	1, 454	41. 73	198	335	747	91	1, 807	20
Colorado.....	661	50. 08	106	150	358	46	1, 077	7
Idaho.....	280	47. 22	19	65	182	9	350	11
Montana.....	187	31. 38	36	54	73	8	185	0
Utah.....	130	18. 81	22	18	41	15	92	2
Wyoming.....	196	69. 01	15	48	93	13	103	0
Region X total.....	12, 704	83. 75	1, 080	2, 620	8, 453	505	21, 297	655
Arizona.....	1, 508	202. 14	190	540	710	68	1, 449	13
California.....	9, 789	93. 94	751	1, 839	6, 794	375	17, 359	483
Nevada.....	360	229. 30	24	37	276	23	222	8
Oregon.....	387	25. 43	47	90	233	17	694	25
Washington.....	660	28. 41	68	114	440	22	1, 573	126
Continental United States..	198, 640	132. 24	18, 211	52, 309	107, 133	12, 836	270, 459	7, 676

<sup>1</sup> Including stage not stated.

Source: Form PHS-688 FSA-PHS—Division of Venereal Disease, Office of Statistics, 2/6/52 (ML: MWS) bk

## Source of Morbidity Reports

Since syphilis is a reportable disease in all States, morbidity reports are received from private physicians as well as from clinics, hospitals, and other public facilities. Although we know that morbidity reporting is not complete, some indication of the relative volume of successful case-finding activity can be obtained by comparing reporting by public facilities and reporting by private physicians. In the fiscal year 1951, about two-thirds of all syphilis was reported by public facilities and one-third, by private physicians. Four-fifths of the reports of congenital syphilis were received from public facilities. Only 14 percent of the gonorrhea cases were reported by private physicians.

## Race and Sex

Morbidity data reported to this division are classified by race and sex. In actual numbers of cases in the fiscal year 1951, about 1.8 times as much syphilis was reported among nonwhite persons as among white

(figs. 4 and 5). In terms of syphilis case rates specific for race and sex, however, the rates for white males and for white females are 60.2 and 44.9 per 100,000, respectively, while the rates for nonwhite persons are 765.8 per 100,000 for males and 810.7

for females. Among white persons, the rate for males is higher than for females, but among nonwhite persons the reverse is true. Gonorrhea cases reported among nonwhites are three times as high as among white persons, and the race-sex specific

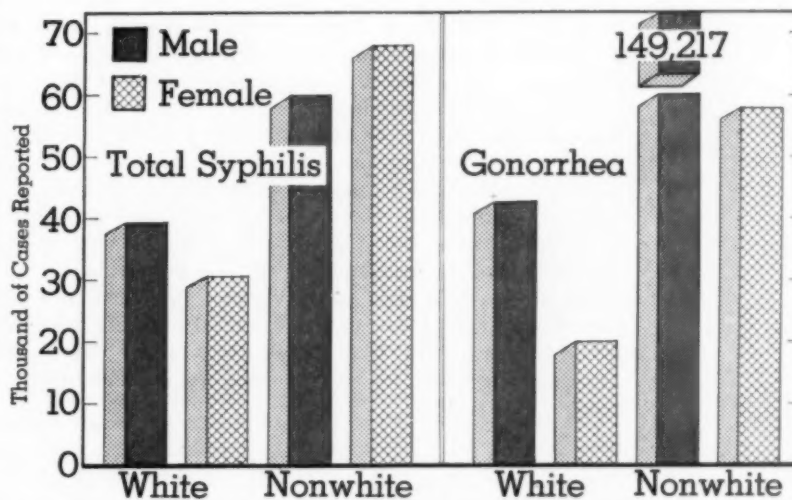


Figure 4. Reported cases of syphilis and gonorrhea, by race and sex, continental United States, fiscal year 1951 (known military cases excluded).

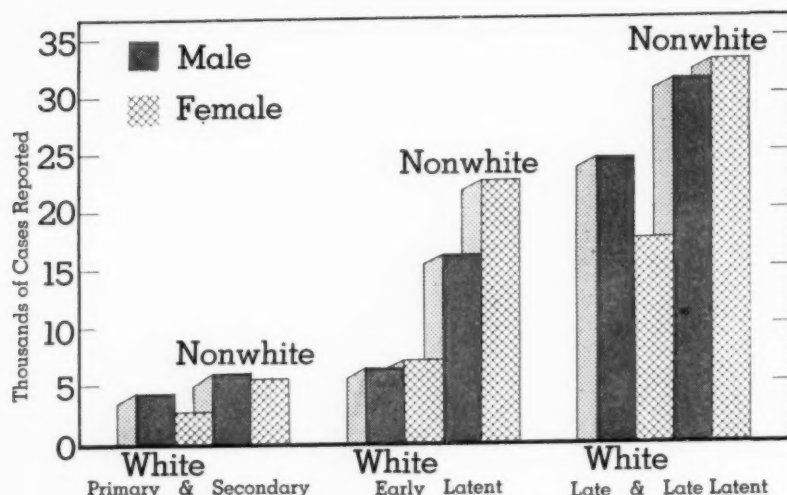


Figure 5. Reported cases of acquired syphilis, by race and sex, by stage, continental United States, fiscal year 1951 (known military cases excluded).

rates per 100,000 population are 65.6 for white males, 29.5 for white females, 1,900.9 for nonwhite males, and 688.9 for nonwhite females.

#### Congenital Syphilis

Congenital syphilis morbidity has not shown a downward trend during

the past few years such as has been shown by all other stages of syphilis. Interpretation of this sustained volume of cases reported depends on more complete information, particularly as to age of the infected persons which indicates the duration of the disease. Only recently have such

data been obtained. The following age distribution was noted for the continental United States in the fiscal year 1951:

Known age:	Number	Percent
Under 1 year-----	715	6.4
1-4 years-----	812	7.2
5-9 years-----	1,928	17.1
Under 10, age un-		
known-----	35	.3
10 years and over--	7,759	69.0
Total-----	11,249	100.0
Unknown age-----	1,587	
Grand total-----	12,836	

Ninety-four percent of the congenital syphilis cases were in persons 1 year of age and over. These represent past case-finding failure as well as present success. Whether the number of cases actually occurring or the fraction of undiscovered cases of congenital syphilis occurring each year is decreasing is a problem to be solved by detailed age data over a period of several years.

## Synthetic Vitamin B<sup>6</sup>

Success in the synthetic production of vitamin B<sub>6</sub>, in its pure form, was recently announced by the Public Health Service.

In the laboratory of biochemistry, at the National Cancer Institute, Drs. Alton Meister, Elbert A. Peterson, and Herbert A. Sober have produced 1 gram of vitamin B<sub>6</sub>, the amount required for the lifetime of one healthy individual. Their work was reported in the January issue of the *Journal of the American Chemical Society*. So potent is the vitamin that man's daily requirements have been estimated to be approximately 2 milligrams—about  $\frac{1}{15,000}$  of an ounce.

Only crude preparations of vitamin B<sub>6</sub> have been available in the past, and these could only be used in experimental studies. Publication of the new synthesis method will make possible large-scale production of the vitamin.

Anemia in cats and dogs results from the lack of B<sub>6</sub>. If the vitamin is missing in rats, the deficiency is known as acrodynia.

The human body also needs vitamin B<sub>6</sub>, which is present in meat, cereals, and yeast. Lack of this dietary essential prevents the body from making proper use of amino acids. It is known that cancer tissue contains a low level of vitamin B<sub>6</sub> and that its way of using amino acids differs from that of normal tissue.

# Ideas

How do you go about getting your job done in health department, hospital, school? Are the ways you go about solving your problems likely to interest others who have similar problems? This "Ideas" section is a place for you to share with your colleagues your experience and approaches to the practical problems of public health practice. The "Ideas" space is not for news reports but for ways and means, a place to report trials and errors in techniques and methods. Send your ideas to us now!

—The Editors.

## Boarding Homes

**MINNEAPOLIS.** Elderly residents of boarding homes are meeting weekly to enjoy "purposeful activities" as well as to participate in recreational and entertainment sessions.

Under guidance of the Family and Children's Service, the group sessions were initiated by a professional social worker and later carried on under volunteer leaders who have been given special training for this work. The aim is to help older folks living in boarding homes to have more worth-while and interesting lives.

More than half the 104 residents now in the program have no other activity. They come from all walks of life and seem to be more handicapped physically, mentally, and emotionally than the average older person.

## Departmental Diary

**BUFFALO.** Each Friday morning the elected and administrative officials of Erie County (N. Y.), as well as leaders of community organizations, the board of health, members of the health department staff, and press, radio, and television representatives receive *Health Notes*, a

single-sheet report of Erie County's health week.

Here—in one-paragraph, easy-to-read items—are reported the activities of the department and health events in the community, plus a health education item aimed at the individual and current morbidity data for half-a-dozen acute communicable diseases.

*Health Notes* is reproduced in typescript via a direct-plate office offset process on a prerun masthead in red ink which carries the necessary postal designation. The address is stamped on the sheet itself, which is sealed with a 1-cent, precancelled stamp.

## Disease Detection

**FLORIDA.** Screening for six major diseases—cancer, tuberculosis, diabetes, heart disease, blood diseases, and kidney diseases—is provided all patients entering the regular services of the Volusia County Health Department. Patients entering the cancer detection, maternity, and health card clinics receive the following: chest X-ray, physical examination, hemoglobin determination, blood count, blood sugar, RH (maternity), blood serology, urine analysis (sugar, albumin, specific gravity), stool examination (for food handlers and others as indicated), and smears for gonococci.

## "Slide Rule"

**WASHINGTON, D. C.** A concerted effort to improve the reporting of "length of pregnancy in weeks" on the birth certificate has been undertaken cooperatively by the State health departments, the National Office of Vital Statistics of the Public Health Service, and the Children's Bureau of the Federal Security Agency.

Key element of the program is a "device for computing completed weeks of gestation." The device can be used continuously from year to year. It provides a systematic and quick method for obtaining the number of completed weeks between the first day of the mother's last menstrual period and the date of the

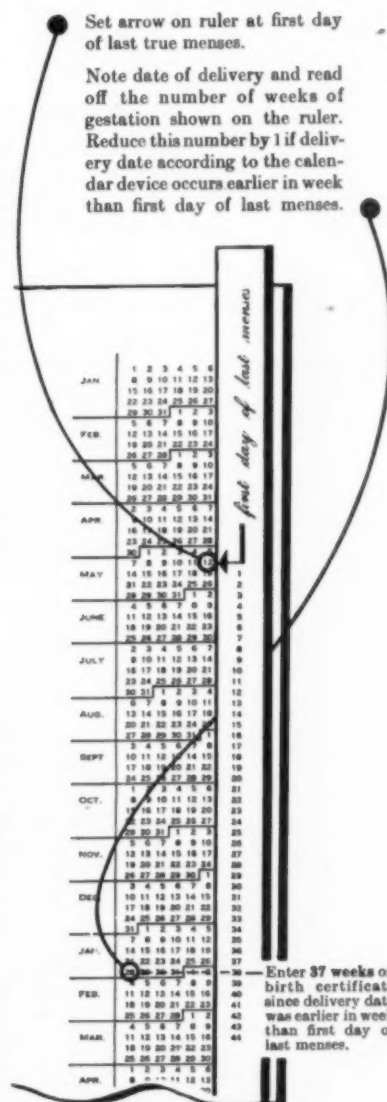
child's birth. Use of the device should reduce inaccuracies now found in reported information because of diversity of computing methods.

The device has been made available to hospitals throughout the country and may be obtained from State health departments, the National Office of Vital Statistics, or the Children's Bureau.

How to use this device to determine completed weeks of gestation for entry on birth certificate.

Set arrow on ruler at first day of last true menses.

Note date of delivery and read off the number of weeks of gestation shown on the ruler. Reduce this number by 1 if delivery date according to the calendar device occurs earlier in week than first day of last menses.



Address inquiries to your State Department of Health



## Handbooks on Sanitation

Since it is generally recognized that sound sanitation practices are an important factor in good service, and healthful, safe, and enjoyable travel is a product of good service, a series of handbooks has been prepared by the Division of Sanitation of the Public Health Service as a guide for persons responsible for maintaining sanitation facilities on interstate carriers. The standards set forth in each conform with the interstate quarantine regulations. Each booklet contains a copy of the Public Health Service report form.

### *Railroad Servicing Areas*

The first handbook has been prepared for persons who design and operate railroad servicing equipment and facilities, and for health department representatives and others who make periodic investigations or inspections of facilities and operations in servicing areas. This publication covers general requirements and specifications for water equipment, employee conveniences, and waste disposal.

### *Dining Cars in Operation*

Because of the large number of passengers carried on trains today, dining car sanitation is of public health importance. The second handbook is designed for those who must apply the principles of sanitation to dining car operation and maintenance. The standards set forth include not only those for sanitation of equipment, storage and handling of utensils, and disposal of waste, but those for floors, walls, doors and windows, lighting and ventilation of the car. Food handling, storage, and the protection of food are also covered.

### *Passenger Car Construction*

The third of the handbooks on railroad sanitation outlines standards for those concerned with incorporating provisions for sanitary

equipment in the design or construction of passenger cars. General standards for water supply facilities, toilet and lavatory facilities, and ventilating and heating are outlined for passenger cars, coaches, sleeping cars, and dormitory cars. Specifications are given for facilities, ventilation, lighting, etc., for dining and bar cars, and for handling, storing, and protecting food in these cars.

### *Vessels in Operation*

The last handbook listed here is the second of a series on vessel sanitation. It outlines standards for persons making inspections of operating vessels, and for those supervising sanitation facilities aboard vessels. The first handbook, "Principles of Sanitation Applicable to the Construction of New Vessels," appeared in 1949. The new booklet covers potable water, wash water, swimming pools, waste disposal, vermin control, food sanitation, and rat-proofing.

Handbook on Sanitation of Railroad Servicing Areas. (Public Health Service Publication No. 66) 1951. 28 pages; illustrated. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 20 cents.

Handbook on Sanitation of Dining Cars in Operation. (Public Health Service Publication No. 83) 1951. 14 pages; illustrated. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 20 cents.

Handbook on Sanitation of Railroad Passenger Car Construction. (Public Health Service Publication, No. 95) 1951. 15 pages; illustrated. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15 cents.

Handbook on Sanitation of Vessels in Operation (Public Health Service Publication No. 68) 1951. 44 pages; illustrated. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 25 cents.

## Survey of Compounds Tested For Carcinogenic Activity

The first edition of this "Survey" covered the literature on experimental carcinogenesis through 1939. The present (second) edition brings the material up to 1947. It lists 1,329 compounds, of which 322 were reported to cause malignant tumors in animals and 35 others to induce only benign tumors.

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Hartwell, Jonathan L.: Survey of compounds which have been tested for carcinogenic activity. Ed. 2. (Public Health Service Publication No. 149) 1951. 583 pages. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. \$4.25.

## What You Should Know About Alcoholism

Prepared for the general reader, this nontechnical publication defines alcoholism and the alcoholic. The symptoms and causes of alcoholism, as far as they are known are outlined. Of importance to the lay reader are the sections on understanding and helping the alcoholic. Here the role of friends and members of the family, and local health and welfare agencies are described.

The sections on treatment include the physical build-up that is usually necessary, drug treatment, and psychiatric care. The work of organizations especially devoted to this field—Alcoholics Anonymous, the National Committee on Alcoholism, the Yale University Laboratory of Applied Physiology, the Yale Center of Alcohol Studies and the National Institute of Mental Health—is briefly covered.

Suggested sources of information, books, and other publications are listed at the end of the pamphlet.

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What You Should Know About Alcoholism. (Public Health Service Publication No. 93) 1951. 8 pages. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15 cents.